Telephony

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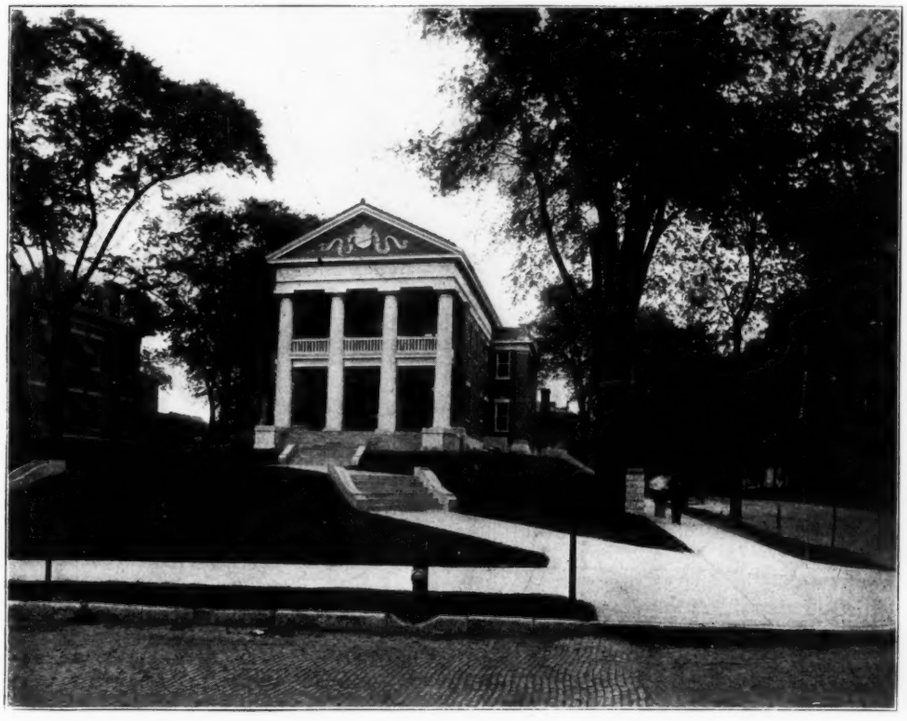
QUINCY'S MODEL TELEPHONE SYSTEM

A Description of what is Claimed to be one of the Most Modern Telephone Exchange Properties in the World.

By E. M. Rothelle

AT Quincy, Illinois, the history of telephone development begins August 5, 1885, when the city council granted a franchise to the Central Union Telephone Company, sub-licensee of the Bell company. The twenty-one years intervening make a record of unbroken reign by that concern up to the organization of the Quincy Home Telephone Company. Prior to the advent of the Quincy Home Telephone Company there had been attempts at competition, but none reached a practical stage.



Exchange Building, Quincy Home Telephone Company.

The first attempt was in July, 1893, when the city council granted a franchise to the Citizens' Telephone Company, leading members of which included such prominent citizens as Colonel Chauncey H. Castle, W. S. Warfield, James L. Martin and others. For a time this movement looked very promising for competition, but, among other provisions, the ordinance required the company to pay to the city two per cent annually on the gross earnings, and also required the plant to be completed and in operation within one year from the time of the grant. Before that time had arrived the movement was dead.

Almost ten years elapsed before another effort was made to share the field with the Central Union, but this second movement was quite formidable, there being two rival applications for a franchise, both made in February, 1903, by outside interests. One of the applications was made by Bills Brothers and the other by the Western Illinois Telephone Company.

The competition by these interests for the franchise was spirited, and for several months the city council was in a state of more or less excitement over the matter, concerning which the aldermen became hopelessly divided.

It seemed to be the feeling on the part of the city council that but one of the applicants should be granted a franchise, and Bills Brothers won, the ordinance being passed April 20, 1903.

It looked plain sailing now for Bills Brothers, whose friends were correspondingly jubilant, but soon an ominous cloud appeared in the form of hints of bribery or attempted bribery of one or more of the aldermen by some one connected with the Western Illinois company. These hints and rumors came to the attention of Mayor John A. Steinbach, who vetoed the Bills Brothers franchise ordinance May 4, 1903, in this language: "Charges of bribery have been made in connection with the two telephone ordinances which were pending before you. I do not know or assert that any improper means were resorted to in the matter. This can only be ascertained after full investigation by the proper authorities. Under the circumstances, however, until such investigation has been made, I believe

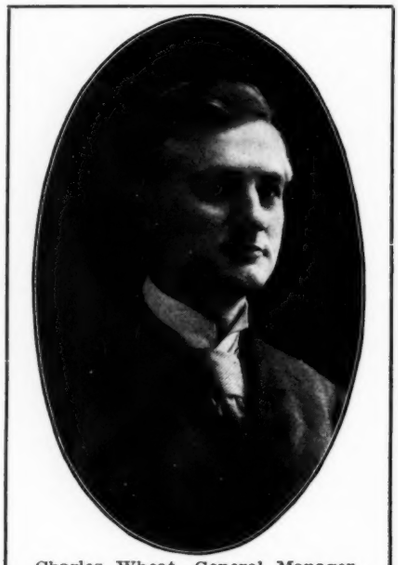
no ordinance on the subject should be adopted."

The mayor's veto was unanimously sustained by the city council and that ended the matter. The bribery question was taken up by the grand jury, which returned indictments, but the cases never reached trial, the charges being finally dismissed by the court for some fault in form.

Thus did the sky again clear for the Central Union Company, making nearly eighteen years of uninterrupted sway in Quincy. Had that company been wise and adopted a sagacious policy, its reign might have continued indefinitely. Ordinary foresight should have shown it that such a city is bound to have telephone competition unless a plant and service adequate for such a city's needs were provided.

But the Central Union allowed the golden opportunity to slip by, contenting itself with making now and then such a showing of improvements as it deemed sufficient, and when the inevitable happened and the hour for telephone competition in Quincy again had struck, the man appeared who proved equal to the situation.

That man was Charles Wheat, of Quincy, with whom the Quincy Home Telephone Company originated, who has been its executive officer since its inception, and whose grasp of local conditions, whose foresight as to the kind of a plant called for and whose remarkable capacity for enlisting men and money in the movement have given him remarkable prestige, which is still increasing.



Charles Wheat, General Manager. Quincy Home Telephone Company.

Prior to his entering the telephone field, Mr. Wheat has been chiefly conspicuous for the marked ability and success he had displayed in political affairs. In all of the political campaigns his clear-sightedness and capacity for understanding conditions and managing men have been much in evidence. Success attended his every effort and his course enabled him to retain the full confidence of his associates and gain the respect of his opponents.

Among Mr. Wheat's personal characteristics is an unfailing optimism besides which Mark Traply's cheerfulness might almost be considered akin to pessimism. Men of cheerful disposition are not uncommon, but few men will endure unruffled such severe and sustained test to which this man has been subjected, yet his whole course shows not a single instance where his optimism faltered. He has been not only sufficient for himself, but inspired courage in others. This trait, coupled with his surprising capacity for winning men to his way of thinking and leading them to invest in that direction, are the two dominating traits in Mr. Wheat's personality.

Mr. Wheat had little trouble in interesting Quincy men of standing and influence in the telephone enterprise, a fact clearly shown by the list of stockholders, including such names as: W. P. Martindale, Frank W. Osborn, Jackson R. Pearce, Frank J. Penick, George P. Behrensmeyer, Fred L. Hancock, Chas. T. Dazey, Henry Steinkamp, Dr. F. E. Nichols, J. M. Winters, Lewis B. Boswell and Alexander M. Simons. The first board of directors consisted of Chas. T. Dazey, the widely known playwright; Jackson R. Pearce, country clerk and a director in the Ricker National Bank; Frank W. Osborn, secretary of the Quincy Coal Company and president of the Chamber of Commerce; Henry Steinkamp, city assessor; J. M. Winters, cashier of the Quincy National Bank; L. B. Boswell, commissioner of the Quincy Freight Bureau, and George P. Behrensmeyer, a prominent architect.

When the request for a franchise was made, the mayor and city council were in a frame of mind that demanded the most rigorous scrutiny of any new application. The echoes of the late scandal had not yet died away and the collapse of former attempts at competition had left the Central Union's friends more firmly entrenched than ever.

The two facts that enabled the Home company to secure its franchise at such an unfavorable juncture was the confidence reposed by the mayor and the city council in Charles Wheat and the men associated with him in the enterprise, and the underlying sentiment of the people in favor of telephone competition. This sentiment was based upon the feeling that the Central Union had not taken proper advantage of its continuous opportunity. Throughout all the course of the ordinance through the council these two facts were in evidence. The franchise was adopted by unanimous vote September 14, 1904.

After the adoption of the franchise ordinance there was still the possibility of a veto, and by a mayor whose vetoes during all of his ten years' tenure of office had been invariably sustained by the aldermen. Furthermore, the recent telephone scandal had left a decidedly unpleasant taste in the mayor's mouth, and he was expected to examine the ordinance with great care before giving it his approval. At least, thus hopefully reasoned the opponents of the Home company.

But Charles Wheat had not planned his campaign and overlooked the chance of a possible veto. He knew Mayor Steinbach well, understood his frame of mind, knew the desire of the executive to act for the best interest of the people, and—a fact of special importance—also realized that the mayor needed and was justly entitled to such facts as would enable him to see precisely what the Home company contemplated and how it intended to accomplish its purpose. Mr. Wheat therefore went to the mayor and frankly laid the whole situation before him, showed him the entire correspondence from the inception of the enterprise, and allowed him to see what kind of a plant the company intended to install in Quincy, the kind of a movement contemplated for Adams county outside of Quincy, and the long distance plans of the Home company. After all of these things had been made clear to the mayor, and he saw the important benefits certain to inure to the city from the enterprise, the question was left in the mayor's hands as to whether or not the franchise was based on merit.

That action on the part of Mr. Wheat was not merely beneficial in winning the mayor's approval of the franchise ordinance, but the confidential information thus laid before the mayor gave him a viewpoint of the company's plans which he could not otherwise possibly have gotten at that time or for long afterward.

Having secured its franchise, the company proceeded with all diligence to carry out the important enterprise and, considering the magnitude of the work and the quality of material required, the record is probably without parallel, while special phases tended not a little to popularize the movement. For instance, from November, 1905, to May, 1906, the company expended $30,000 in Quincy for manual labor alone.

By July the status of the enterprise was such as to win public praise from many men of prominence, at a dinner given on the evening of July 6th at the Country Club, the event being planned by Mr. Wheat and other officers of the

company, in honor of a visit to Quincy by Mr. Paul Latzke, the noted magazine writer, and author of "A Fight With an Octopus." Other guests were J. P. Hinton, cashier of the Hannibal National Bank, T. D. Dulaney, W. C. Kettering, George W. Whitecotton, all directors of the Hannibal Independent Telephone Company; A. D. T. Libby, vice-president of the Dean Electric Company, of Elyria, O.; Kempster B. Miller, a member of the firm of McMeen & Miller; Mr. Samuel G. McMeen, the other member of the firm, and the following named Quincy men: Mayor John A. Steinbach; F. W. Osborn, president of the Chamber of Commerce; C. F. Perry, secretary of that body; David Stern, of J. Stern & Sons; J. H. Bastert; Fred Wilms, president of the Mercantile Trust & Savings Bank; Wm. T. Duker, head of the W. T. Duker Dry Goods Company; W. E. Kendall; J. R. Pearce; Col. George R. Cottrell; A. C. Bickhaus; F. L. Hancock, city engineer; John S. Cruttenden; John J. Fisher, head of the Excelsior Stove & Manufacturing Company; Harvey G. Riggs; F. A. Parker; W. E. Miller.

The elaborate menu was followed by speech-making, in which the Home company received compliments on every hand. Mr. Latzke characterized the plant as "a perfect model," having a larger proportion of underground system than found even in many larges cities; while the admirable fire-proof office building he declared to be unique. Owing to the extent of the underground system, added Mr. Latzke, the cost of maintenance would be less than two per cent, as against about ten per cent for the cost of maintaining an overhead system.

Mayor Steinbach referred to the promises made to him by Mr. Wheat after the passage of the ordinance, and the mayor added that the promises had been made good.

The advertising policy of the Home company was in harmony with its other rational and business-like methods. The company inaugurated no warfare upon the Central Union, but contented itself with setting forth the merits of its enterprise, the character of its plant and equipment and the standing of the men who were in the company and doing its work.

Among other points to which the company called attention in its advertising was the fact that under the franchise ordinance the company will pay to the city a bonus of two per cent on its gross receipts. Another fact made prominent was that it is a genuine home company; also the underground system was, of course, duly exploited. The advertising matter included sketches of Messrs. McMeen and Miller; John M. Humiston, superintendent of construction; Maxime Reber, the consulting engineer; A. M. Crichton, superintendent of maintenance; Ray H. Manson, installer for the Dean Electric Company, and Frank A. Parker, the local manager.

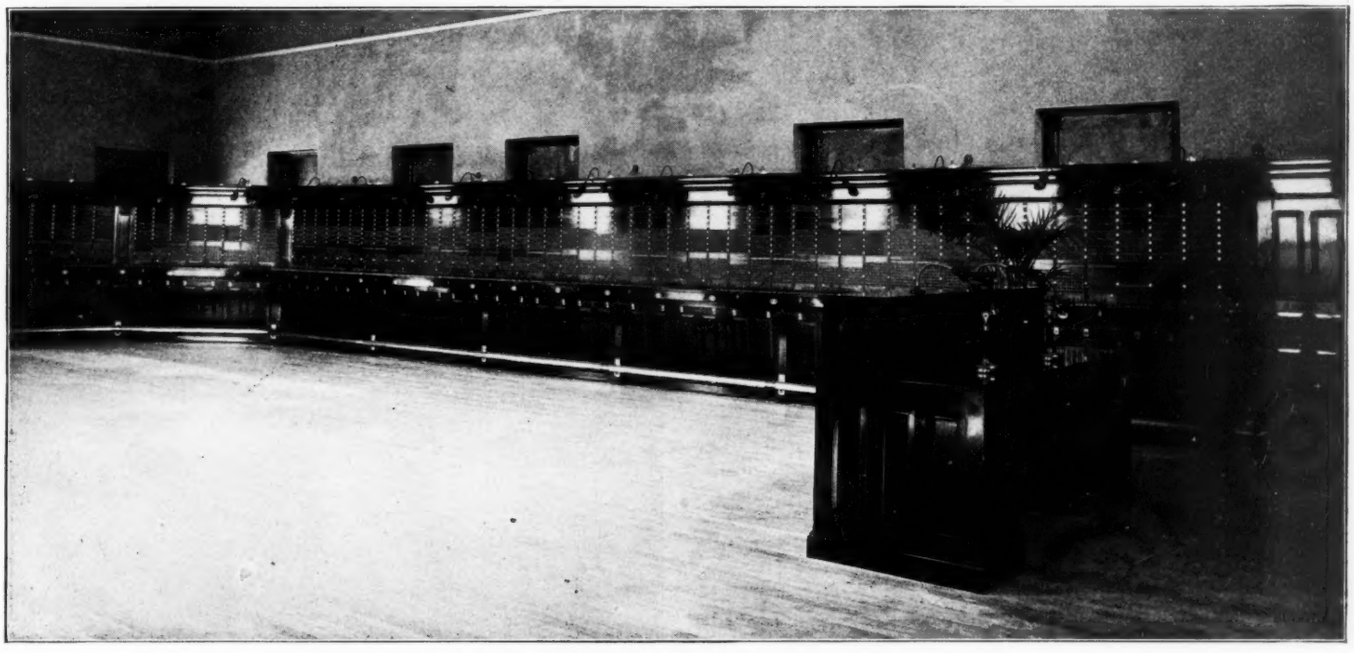
In other words, the advertising policy of the company paid no attention to the Central Union, but the latter company inaugurated an entirely different policy of advertising.

The Central Union printed in all of the local daily papers July 7, 1906, an advertisement under the following caption:

"What They Say in Toledo About Telephone Promoters—Editorial in Toledo Times, May 28, 1906, Modern Gold Brick Swindling."

The body of the advertisement was in harmony with the heading, and of course the Home company accepted the challenge, making prompt and complete defense of the local citizens who had promoted and were carrying on the new company. The advertising war thus inaugurated by the Central Union was carried on for more than a month, and the newspapers of the city were full of the broadsides from both companies. While keeping up its vituperative policy, the evident object of the Central Union was to try to convince the people of Quincy that the Independent telephone movement in other cities had been a failure, but as fast as one such allegation was made the Home company printed facts showing that the statements were without proof, citing Toledo, South Bend, Lincoln, Baltimore, Shelbyville, Los Angeles, Moline, Peoria, Rock Island, Springfield, St. Louis, and many other cities. Among the telling and effective advertisements printed by the Home company were letters from Paul Latzke sympathizing with the Independent movement and dealing powerful blows at the trust.

During this advertising campaign the Home company was rapidly proceeding with the installation of its magnificent plant, and on July 14, 1906, the first step was taken in the county outside of the city, namely the organization of the Adams County Home Telephone Company, including nearly one hundred and fifty substantial stockholders.



Switchboard, Quincy Home Telephone Company.

The directors of the county company are Thomas S. Elliott, Ezra Best, J. H. Best, Charles H. Achelpohl, Wm. W. Booth, Henry Wiskirchen, Fred P. Taylor. The officers are as follows: President, T. S. Elliott; vice-president, Henry Wiskirchen; secretary, Charles H. Achelpohl; treasurer, Ezra Best.

The county company is capitalized at $500,000, of which amount about $200,000 will be spent in new construction

General Office Quincy Home Telephone Company.

during the year 1907. The first line is now being built from Quincy southeast toward Payson.

The declared intention of the Adams County Home Telephone Company is to reach every village, home and farmhouse in Adams country, with a metallic circuit and on individual, two, four and eight party lines. This company will have exchanges in all towns and villages in the county including Camp Point, Clayton, Golden, Payson, Plainville, Liberty, Ursa, Mendon, Lima, Loraine, Fall Creek, Columbus and Burton.

The Quincy Home Telephone Company directory was reorganized September 13th as follows: David Stern, W. T. Ducker, J. H. Bastert, David Riedinger, J. R. Pearce, Ezra Best, Fred Wilms, Frank J. Penick. The directors elected officers as follows: J. R. Pearce, president; Frank J. Penick, secretary. Following is a description of the company's admirable plant, which is now completed:

The Home building is located at Sixth and Broadway, and is a fireproof structure of the latest design. It is erected on high ground where there is no danger of water entering the building and working any destruction to the insulation of the wires. The building has ample facilities for terminating the underground conduit system and housing the central station equipment, operating forces and administration departments. In the rear of this central office building, facing Spring street, is a brick warehouse of slow-burning mill construction, and sufficiently commodious to house all of the supplies which it is necessary to keep under cover.

The entire upper floor is used for the exchange room, long distance room and suitable retiring rooms for the operators, while on the floor below are located the offices, terminal and distributing and power rooms.

The company has completed the installation of its exchange equipment, having an ultimate capacity of 6,400 individual lines. The switchboard and central office equipment was furnished and installed by the Dean Electric Company, of Elyria, Ohio. It is designed on the central battery plan, and is equipped with all the latest features in the way of automatic calling and supervisory signals. The present capacity of this exchange is 3,000 individual lines, with an additional 300 answering jack and line signals to facilitate in intermediate cross connecting. The company has reserved 1,000 lines for individual lines, the other 2,000 for four-party selecting ringing lines, thus having a present capacity of 1,000 private and 8,000 party lines. Provision is made and space reserved for the ultimate capacity.

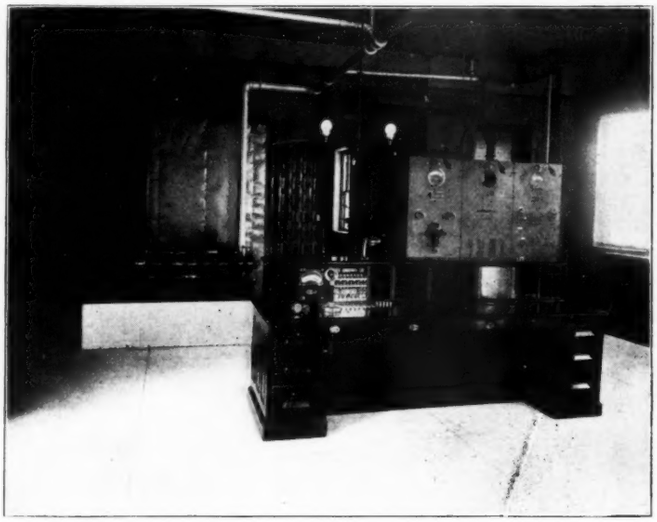
The switchboard consists of eight sections divided into eight panels of three regular operator's positions. Each section is equipped with 500 answering jack and line lamp signals, first position having 180, the other two 160 each. Each position has sixteen pairs of cords. The cords are arranged in a color scheme whereby no two adjacent pairs have the same color, thus facilitating the taking down of a completed connection and preventing annoying mistakes. Every cord circuit has a listening and four-party line selective ringing key, so arranged and wired that the operator rings a single party or a four-party selective subscriber with the same cord by depressing the proper button, which will remain in the indicating position until the next call, thus relieving the operator from the necessity of remembering which way she rang previously on line should the called subscriber not answer immediately.

The springs on the keys are of the best grade of German silver, all contacts being of platinum, there being only two series of contacts in the talking circuit due to the selective ringing key instead of the eight or ten such contacts usually present. These contacts also are located so as to be open for inspection by simply lifting the hinged key shelf.

Each position is provided with a test cord for making line relay, line lamp and cutoff relay tests direct from the switchboard without disturbing the subscribers, thereby forestalling all chances of such trouble interfering with the operation of the switchboard.

A test jack and key are also provided for making complete cord and supervisory signal tests on each position, so that the condition of the cords at any position can be readily and quickly ascertained.

Each operator's telephone equipment includes a head



Wire Chief's Room, Quincy Home Telephone Company.

telephone with adjustable breastplate transmitter with silk cords terminating in a four-conductor plug. A twin jack is provided at each operator's position for this plug, one for regular and the other for emergency use, or for connecting a learning operator's set. These jacks are so designed that the operator's transmitter battery circuit is opened when the plug is removed, thus preventing unnecessary waste of current.

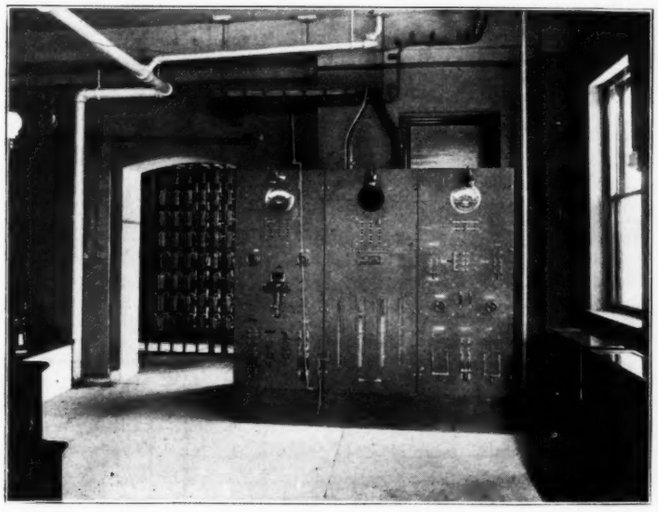
The framework of the switchboard is of substantial iron and steel construction, firmly riveted and bolted together

and standing on the true floor; all woodwork on the face and ends of the switchboard is finely finished mahogany, each section having rear doors arranged to slide sideways on tracks or to lift out.

The cables leading into the switchboard are elevated two inches from the floor to prevent absorbing moisture from same.

The local wiring of each section is easily accessible from the rear. The answering jack cables run along elevated from the floor to the intermediate distributing frame; above these are the two condensers for the cord circuit, both encased in one covering. Above these supervisory relays are inclosed in dust-proof cases. The relays are on a mounting plate securely fastened to the framework of the switchboard, and are easily removable. Immediately above the relays is the cord rack and above that the answering jack cable forms. In the upper portion of the switchboard is the multiple cable shelf which is securely fastened to the framework and braced from below. The rear of the frieze board is almost entirely free from apparatus.

All cables are so arranged as to produce no cross talk, and are of tinned copper wire 97% pure, and not smaller



Power Board, Quincy Home Telephone Company.

than No. 24 B. & S. gauge, each wire having an inner insulation wrapping of silk and an outer wrapping of cotton, arranged in color code so as to secure the proper selection of wires. These cables are each covered with several layers of paper, and an outer braid of cotton, treated with a fireproof composition.

The line and talking circuits on the system are strictly metallic and perfectly balanced under all operating conditions, the four-party selective system working on a metallic circuit with ground or third wire connections, and are absolutely non-interfering.

The switchboard sections are lighted front and rear with two circuits; alternate position supplied from different circuits.

A two-position chief operator's and monitor's desk is installed and provided with all the necessary circuits for complete supervision of the exchange. The monitor's position contains the latest and most improved system of supervision, consisting of line and supervisory pilot lamps for each operator's position, arranged so as to light whenever any line calling or answering supervisory signal is displayed on the main switchboard, and remain lighted until the operators perform their work. Keys associated with these pilot lamps allow the supervising operator to listen to the conversation of each operator secretly or to carry on conversation directly with each operator.

There are four trunks from the chief operator's desk to the main board, so that she may be connected directly to any subscriber's line without the local operator being able to listen to the conversation. Circuits are also provided on her desk whereby she may directly observe the service any subscriber is receiving which these circuits are connected to.

A three-position wire chief's desk is installed with adjustable testing apparatus for almost any trouble which may arise. The main and intermediate distributing frames are located in the distributing room. The main frame is provided with connectors for 4,000 local lines. Lightning arresters and sneak current protectors are furnished equal to the equipment of the switchboard. An annunciator signal is connected with these, with a common alarm bell provided for each arrester, arranged to operate when any heat coil opens. Flame-proof jumper wire is used throughout. The intermediate distributing frame is equipped with connectors for 3,400 lines.

The relay frame is equipped with mounting strips for individually insulating each set of line relays, which are encased with dust-proof caps.

The power plant is equipped with two sets of charging units. These machines are specially designed so that the battery can be charged without the need of an impedence coil. In case of battery failure, the exchange can be commercially operated from these special machines, with only a slight noise being produced in the talking circuits. One of these machines is directly connected to a 500-volt direct current motor and the other directly connected to a 110-volt alternating current. A set of motocycle ringing generators are also installed to furnish four-frequency ringing current. A duplicate set of harmonic converters is installed and mounted in mahogany cabinets, taking power from the storage battery to furnish the frequency currents for regular harmonic ringing.

The battery installed consists of eleven cells of chloride accumulator battery sufficiently large to furnish continuously for a period of thirty hours battery current sufficient to operate the exchange.

A combined three-panel slate power and fuse board is furnished, mounted in an angle iron framework, containing all the necessary switches, voltmeters, overload and underload circuit breakers, and all fuse apparatus necessary to manipulate the various power circuits.

The subscribers' line lamps and relays and operators' position circuits are provided with indicating fuses for each operator's position and a common alarm for same. A contact circuit breaker is connected to an alarm circuit, so that the attendant will be called when any breaker switch opens. Thus provision is made for any emergency which may arise.

The underground conduit system consists of vitrified clay conduits of the multiple duct type laid on and completely surrounded by a shell of Portland cement concrete. These conduits are intersected at suitable intervals with underground vaults having manhole entrances from the street which afford facilities for drawing in and splicing the large cables which are used. This conduit system covers a considerable portion of the city which was not required by the franchise. The original plans have been extended until conduit entrances have been made to 237 city blocks. It covers the district from Front street on the west to Twentieth street on the east and from Payson avenue on the south to Cherry street on the north. This conduit connects with 31 buildings in the business district and with distributing poles in the 237 blocks in the district defined above and with a few short pole routes extending outward from the edges of this district. In the conduit system are installed cables of the required number of individual wires laid up in pairs in order to prevent inductive disturbances. These underground cables connect at the proper points through the lateral connections with the aerial cables on the short pole routes and with the distributing points on

poles which have exclusive underground connections. This aerial cable is carried as near to the subscriber's premises as possible and terminated in protected terminals of the latest design, which have the different conductors on the cable distributed among them in such a manner as to give the highest efficiency and flexibility to the system. From these terminals drops are made to the subscriber's promises through duplex twisted rubber covered hard drawn copper wire. These individual drops are connected on the subscriber's premises with the interior wiring by properly protected apparatus, thus finishing a complete copper metallic circuit between each instrument and the central station.

The company began rendering service September 4, and is now adding subscribers at the rate of about fifty a day.

QUESTIONS AND ANSWERS

By J. C. Kelsey

We have a cable 2,450 feet long, 2,430 feet No. 22 wire in one continuous piece, balance of No. 20 wire. Cable has been giving trouble, being slightly grounded, and we can find no wire through good enough to make the test with. We have a slide wire bridge with three coils, and set it up as follows: Measured a No. 12 wire parallel to cable; resistance wire to ground, fifteen ohms. Resistance No. 12, and one wire in cable twenty-seven ohms; making resistance of copper wire twenty-two ohms. Using Murray loup test with these two wires gives a reading of 342 on a scale of 1,000. The query is, will the following solution give the distance to the trouble? $X=\frac{27\times342}{1000}$ or 9.234 ohms which is the resistance from the test to the fault showing resistance of No. 22 wire one ohm to 61.9 feet. Therefore the distance to the fault is 571.58 feet. The chance for error in this solution lies in the two different sizes of wire in the cable. Would this cause enough variation to throw the calculation off?—C. L. P., Nebr.

The error lies in the amount, twenty-seven ohms. A No. 12, wire having a length of 2,450 feet, has a resistance of 3.78 ohms. A No. 22 wire, also 2,450 long, has a resistance of 39.58 ohms. The total resistance of the faulty loop will be 43.36 ohms. Murray's loop formula is $X=\frac{A\,L}{A+B}$. Assuming L to be in ohms, and reading A 342 ohms, B 1,000 ohms, then X would equal eleven ohms. Eleven ohms gives 680.9 feet.

I am very anxious to learn the best and most reliable method of measuring to an open in a toll line with a galvonometer and bridge. —L. H. A., Okla.

In Figure 1, *A* is a fixed resistance of a Wheatstone bridge and *R* the variable resistance. *B* is an ordinary buzzer, so arranged as to operate and impress upon the circuit an interrupted electrical current. A telephone receiver connects the arms of *A* and *R*, and indicates the condition of the balance. As long as currents at points *A* and *R* are equal, no noise is heard in the receiver.

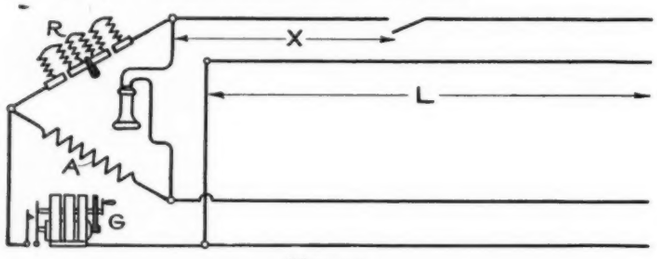


Figure 1.

One circuit has an open wire at a distance called *X*. There is also a good wire, good throughout its length, which we will call *L*.

Between each pair of wires, there is a capacity in direct proportion to the length of the pairs. This permits currents of different amounts to flow into the two circuits.

When the adjustable resistance *R* is shifted, so as to balance the circuit, no noise is heard; hence the current flowing into the good circuit has a definite ratio compared with the current flowing in the bad circuit.

When *R* is changed so as to make current conditions equal, no noise will be heard in the receiver; therefore *R* times *X* will be equal to the *A L* effect and *X* will equal $\frac{A\,L}{R}$, which is the distance to the open place.

This method is used for underground cables as well, and with practice, a fault may be correctly located.

In August Telephony you printed an inquiry from Arkansas regarding the use of three bridging telephones, so arranged that each telephone subscriber may select the other two. According to Figure 2 there are three telephones. All talking sets are bridged across the same pair of wires. No two bells across the same pairs. Special hook switch, in which generator is connected on one side of the line, only when hook is down, and being connected to selective switch on other side. Three positions on selective switch, best illustrated by tracing call from A station. A calls B by throwing switch to position 2, and ringing in usual manner, thus sending ringing current along wires *Y* and *Z*. C is

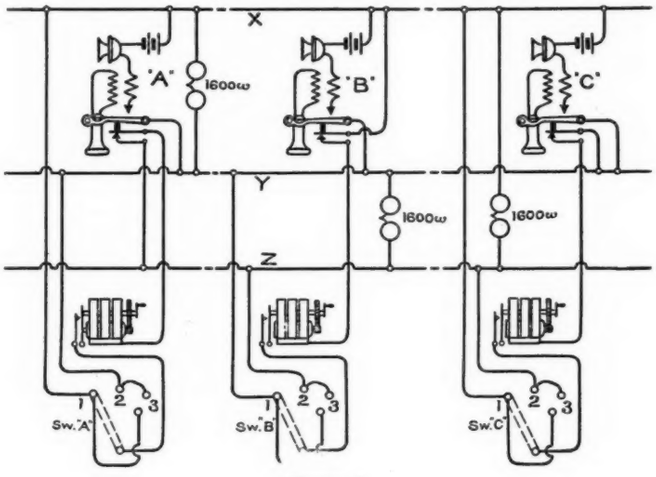


Figure 2.

called from A by using contact 1, sending current along *X* and *Z*. B and C are called together by using contact 3, which having double buttons, short circuits the A bell and makes *X* and *Y* common, ringing both B and C bells. The system can scarcely be said to be normally bridging, and thus falls short of the conditions imposed. It can be made normally bridging, but not without the addition of ridiculous complications. It has no practical value, is a mere curiosity and is submitted in answer to what I conceive to be a hypothetical question.

What would be the result if a carbon lightning arrestor was en-

closed in an air tight cup made of No. 20 B. & S. gauge brass, (brass cup to be connected to ground) if an excessive charge of lightning should pass through it?

Will lightning arc from carbon to a metal ground, as well as from metal to a carbon ground, or from carbon to a carbon ground, and if not, why?—C. I. S., Kansas.

If the lightning arrestor was enclosed in an air tight cup made of No. 20 B. & S. gauge brass, and the brass was connected to ground, and an excessive charge of lightning should pass through it, the tendency would be to blow up the cup, as the arc would heat the enclosed air, expanding it, and forcing the cup out.

This would be the case if the cup were touching the carbon, or if the carbons were entirely separated from the cup, although in the latter case, of course, the explosion would probably be stronger.

Lightning will arc from carbon to metal ground, as well as from metal to carbon ground, and will arc from carbon to carbon ground, or metal to metal ground, and almost any other way.

Mr. Pardee says, in answer to queries about possible results of lightning charges, it either will, or will not, and probably does, or does not, in every case. This is perfectly safe, and you can't go wrong. Coming from Mr. Cook's lightning expert, this statement is comforting, as I have been answering questions regarding lightning this way for a long time.

I would prefer carbon blocks for arrestor terminals, although the copper blocks, with a separator between, may be all right. I do not believe that it makes much difference, just so the area is sufficient to carry off sudden accumulations of static charges.

Referring to sketch (Figure 3) *A, B, C, D,* and *E* are stations on this road. Line No. 1, is ground circuit telegraph line with primary batteries at *A* and *E*.

Lines No. 2, 3 and 5 are bridged metallic, 1,600 ohm magnet, local battery lines, each with a number of stations bridged on between different stations shown.

I have a light and power plant running twenty-four hours a day, seven days a week at *B*.

I want to get rid of the primary batteries at *A* and *E* and install storage battery at *B*. Would it be practicable to bridge line No. 2

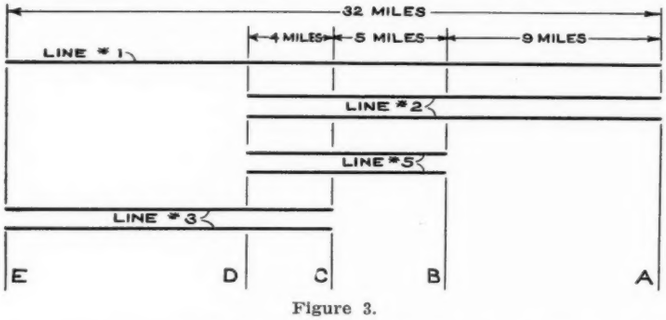


Figure 3.

at *A* and *B* with a high inductive resistance, or resistance with high coefficient of self-induction, closing the same with line No. 5 at *B* and *C*, also line No. 3 at *C* and *E* by looping in storage battery at *B* and connecting line No. 1 to center of resistance at *A* and *E*, thus making metallic circuit telegraph line of No. 1 and portions of Nos. 2, 3 and 5?

There are good service reasons why storage battery should not be cut in on line No. 1 at *B*, which would seem the simplest method. —W. M. L., Md.

Your scheme is practicable. You could easily put your impedances at *A* and *B* on line No. 2, at *B* and *C* on line No. 5, and at *C* and *E* on line No. 3. By putting sufficient capacity about the telegraph sets, and having nicely balanced impedances, you would not know when the telegraph circuit was in use, and would not interfere with the ringing.

From your comment on my letter, published in October Telephony, I think I have been misunderstood.

It was not my intention to advocate lower ringing voltage in general practice. I simply expressed the wish that it be tried on ringers that stick without any apparent cause, in order to prove whether or not the sticking is caused by the permanent magnet being too weak in proportion to the flux from the electro-magnet. In practice, I think it would be better to replace weak magnets with stronger ones.—W. F. H., Neb.

I am glad W. F. H. presents more information concerning the sticking ringer. I did not wish to give anyone the impression of criticism, as I am in no position to do so. So far I can offer no explanation. I do not believe all the evidence is in yet. Surely, more readers have had experience.

Why is it that dry batteries will run down quicker lying down than standing up? Which is the correct way to connect carbon lightning arrestors, with a fuse protection? Should the line go next to the carbon or the fuse? I would like to have the readers of Telephony give their opinions for the questions are being debated very strongly here at the present time.—E. H. P., Neb.

It was the evident intention of the original maker of dry cells to get one that would not slop over, and what else he had in mind, I cannot say. I have no knowledge of the difference you mention.

Regarding arrestors, I would prefer to place the fuse toward the line side. Fuses cost money, and the arrestor discharge may save them. It is an old question, but there is no reason why fuses should be subjected to strain, except when current is passing into the exchange apparatus. Carbon next to the line is preferable every time.

Please explain why the armature of ringers sometimes stick to one side of the cores, and will not ring so long as armature leans that way.

On one of our new farmer lines we have a telephone that "goes dead" and when the transmitter is tapped the trouble clears up.

We have several 4-bar generators on farmer lines and subscribers are unable to ring the drops down at central. The switchboard drops were changed, but without effect. When new generators were put in the old drops worked satisfactory.

I have tried G. W. K.'s phantom scheme to make a second grounded circuit out of one metallic circuit. I find cross talk, and when you ring on the line both parties answer.

Have not tried making third metallic circuit out of two metallic circuits yet, but would like to know if it will make any difference since one of our circuits is No. 14 B. B. iron wire for part of way and No. 12 B. B. rest of way. One circuit is all No. 12 wire.—W. J. C., Ohio.

Telephony has had considerable discussion so far concerning sticking ringers, but as yet I can give no satisfactory reason. Read the October Telephony.

The "going dead" telephone is always a mysterious trouble at first glance. Just why tapping a transmitter will cause you to be able to hear, seems strange, since it is usually not in the same circuit. It must be that there is a common connection that is loose, and tapping of transmitter might cause a closing of the contact.

Generators working on heavily loaded lines have a tendency to become demagnetized from certain armature reactions. They were probably entirely run down. There is a great deal of deceit practiced on people, right on this very question. There is as much science and care necessary to design a generator as any other part. It is a most mismanaged machine.

Your experience with G. W. K.'s phantom circuit seems to be universal. I would suggest a direct communication to him. Address G. W. Kotts, Union Telephone Company, Hope, N. D.

It is reasonable to suppose you would have trouble, since balance is first requisite of a phantom circuit. If you would transpose the two circuits, you would tend toward a balance.

THE AUTOMOBILE TELEPHONE.

The latest addition to C. F. Steele's auto equipment is a road telephone which is carried in the machine on trips through the country, says the Alpena, Michigan, News. To the instrument is attached wires which may be connected with a telephone line in any part of the country and direct and immediate communication may be had.

MANSON'S PRACTICAL SUGGESTIONS

A Series of Short Articles Dealing with Important Phases of Telephone Work

By Ray H. Manson

SPRING CONTACT RELAY ADJUSTMENT.

A MAJORITY of all the relays used in modern telephone exchanges are the spring mounted contact type. This is probably due to the fact that when properly made and installed they will work continuously without further attention or adjustment. However, the accessibility of their working parts makes them the first point of attack for the untrained trouble man, and as a consequence, serious disorders are often introduced which have been known to accumulate until the operation of the exchange was an uncertain quantity.

While these spring contact relays are made in many different designs, the principle of their correct operation and adjustment is the same. Figure 13 shows a well known form which will be used as an example to illustrate the details of adjustment. A so-called "break" or back contact relay is represented in *A* and *B*, the latter view showing its operated position. When this relay is in its normal

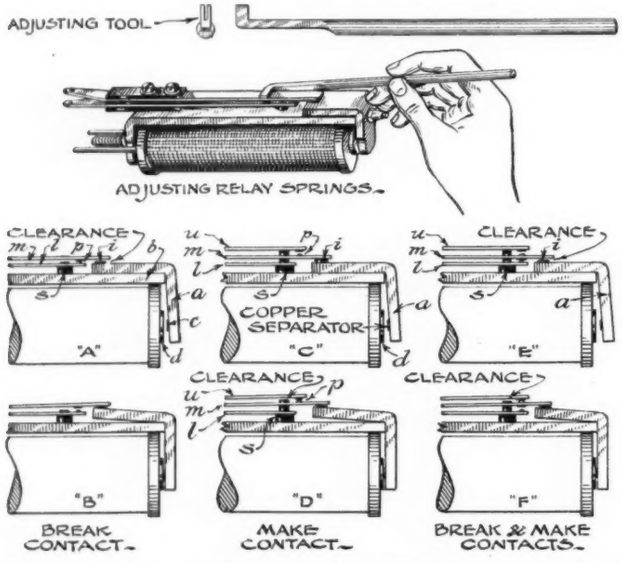


Figure 13—Spring contract type relays illustrating the proper mechanical adjustment for the parts. A simple adjusting tool is also shown.

condition, the platinum contact of the lever spring *m* should rest firmly on the platinum point of the lower spring *l;* while a clearance space of nearly one-sixty-fourth of an inch should be left between the former and the armature insulator *i*. The armature thus has some free play without lifting the spring *m* and separating the contact points *p*. Allowance is thereby provided for the wearing away of the platinum or for slight mechanical changes in the normal position of the armature, both of which would tend to give an uncertain electrical contact between the springs.

When the armature *a* is drawn up against the pole piece *d*, the contact points should be separated nearly one-sixty-fourth of an inch, this distance, however, depending entirely upon the construction of the relay.

A thin non-magnetic metal separator *c* is necessary to prevent the armature from sticking to the core after the current is disconnected from the windings. This separator is usually a copper rivet with a large flat head about .003 of an inch in thickness. When this rivet head is small in diameter the armature must be adjusted to keep its surface parallel with the end of the core, when in its drawn up position, otherwise the proximity of the iron at some point will cause the sticking.

The magnetic sticking, previously mentioned, must not be confounded with defective mechanical adjustment of the relay armature. That is, the armature should work

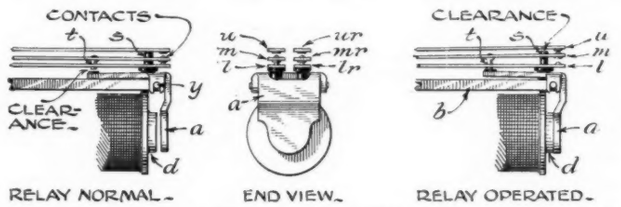


Figure 14—Another form of spring contact relay, similar to that shown in Figure 13, but with the contacts located at the front end of the relay structure.

perfectly free through its whole range of movements when the contact springs are held up by hand.

Once a relay is installed on a mounting strip it becomes next to impossible to adjust the contacts or change the tension of the springs with a pair of pliers, which is, unfortunately, the tool most commonly used for this purpose. The upper portion of Figure 13 shows the proper tool, which is a simple adjuster made to fit over the relay springs so that any desired change can be readily made from the accessible ends of the relays. It is made from a three-sixteenths-inch Bessemer steel rod with a slotted arm extending at right angles to one end. This arm fits tightly over the relay springs so that a slight up or down movement of the handle will make the necessary adjustment change. When the tension, only, of the spring is to be changed, this tool should grip the spring back near the mounting screws, otherwise the armature adjustment will be affected. If there is much change necessary in the spring, the tool should be inserted as in the last case and at about every one-quarter of an inch for the length of the spring, several slight and successive movements should be made with the adjuster handle so as not to make a kink or bend in the spring at one place.

Diagrams *C* and *D* of Figure 13 illustrates the so-called "make" or "front" contact relay. In this relay it is not necessary that the lever spring *m* should rest free from

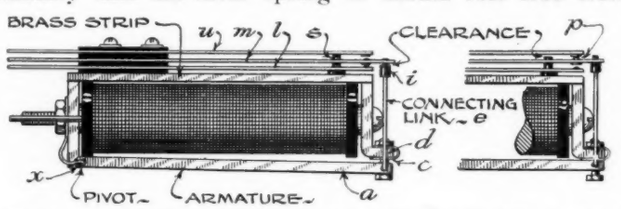


Figure 15—Spring contact type relay with its armature arranged parallel to the contact springs and with a connecting link to transmit the armature motion to the latter.

the armature insulator *i* and the tension of the spring can be made only sufficiently great to restore the armature after its operation, although when the relay is used in a line circuit its tension should be made great enough to restore the armature against the pull of the magnet, due to leakage of current through its winding. For this reason all line relay

tests are made as subsequently described with a permanent leakage through a 10,000 ohm resistance, the latter representing the greatest leakage permissible on a serviceable common battery line. When this "make" contact relay is in its operated position, *D*, Figure 13, the upper spring *u* should be raised so as to clear the insulating stop stud *s* nearly one-sixty-fourth of an inch. Furthermore, the upper spring *u* should have fairly strong tension against this stop *s* so as to insure good contact when the relay is operated.

The lower spring *l*, which is not provided with a platinum point, is used merely to hold the stop *s* in position so

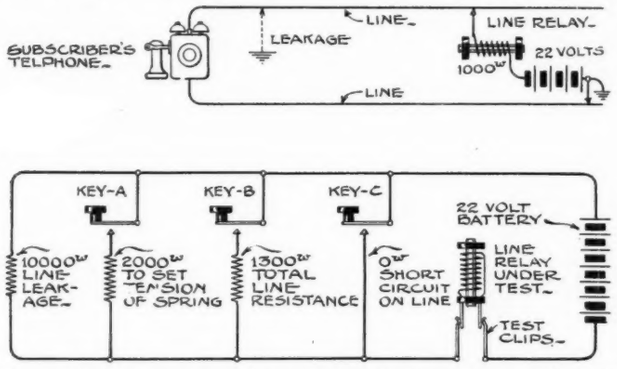


Figure 16—The upper portion of this cut shows the electrical condition of a line relay in a common battery line circuit. The lower portion of this cut is a test circuit for adjusting a line relay to these line circuit conditions.

as to line up with the perforation in the lever spring *m* and insure a free movement to the latter.

Views *E* and *F* of Figure 13 show a combined "break" and "make" relay which includes details of adjustment from both of the forms shown in *A* and *C*.

Figure 14 shows a relay similar in type to that illustrated in Figure 13 and which has the same possible arrangement of contact springs. The armature action, however, is transmitted to the lower spring in a different manner. A small metal stud *t* is riveted to the lever spring *m* so as to project downward through an opening in the lower spring *l* and thus receive and transmit the armature movement. This allows all of the contact points to be brought out to the front of the relay structure. The same clearances between the lever spring stud *t* and the armature, and between the raised upper spring *u* and insulation stop "s" should be allowed as in the former design of relay.

In this particular relay shown in Figure 14, the nonmagnetic metal separator, to prevent the armature from sticking to the core, is provided by a brass ring which

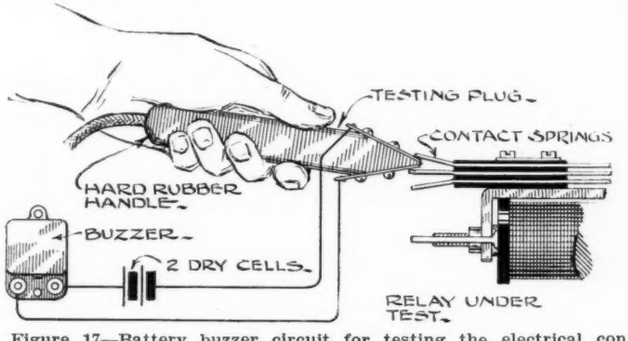


Figure 17—Battery buzzer circuit for testing the electrical contact between the platinum points in a relay. The low voltage of the buzzer circuit will readily show a poor connection.

surrounds the end of the core at *d*, and which is left projecting about .003 of an inch.

A spring contact type of relay, with an armature arrangement differing from the two preceding designs, but with all of their possible spring and contact combinations, is illustrated in Figure 15. The armature is located on the opposite side of the winding to the contact springs and its motion is transmitted to the latter by a connecting link *e* provided at the front end of the relay. The adjustment clearances are indicated in this illustration. A thin nonmagnetic metal clip *c* is used to prevent the residual magnetism from sticking armature *a* to the pole piece *d*.

Now, with the proper mechanical adjustments and clearances, provided as previously described, it is a comparatively simple matter to determine whether the tensions of the springs are sufficient to insure good contacts between the platinum points. This tension, of course, should be made as great as possible, the limiting factor being the power available to give positive operation of the armature. It is, therefore, practically necessary to adjust each relay for the kind of circuit in which it is to work. Take, for example, the case of a line relay, of the construction shown in Figure 13, *C* and *D*, for a common battery exchange. Here, we will say that the line and instrument circuit resistances will not total more than 1300 ohms. Figure 16 shows the arrangement of a test circuit for adjusting the relay for this condition. The tests would be made in the following sequence:

1. Press key *A*. The tension of the lever spring *m*, Figure 13—*C*, should be made sufficiently great to just prevent the armature *a* from drawing up against the pole piece *d*.

2. Press key *B*. The armature should now positively

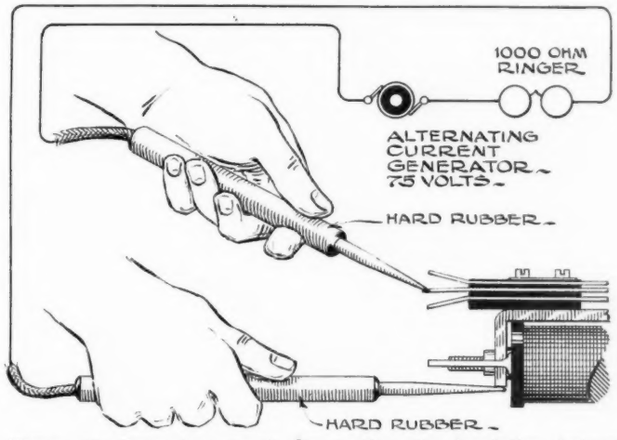


Figure 18—Generator circuit for testing the insulation between current carrying parts of a relay. The high voltage of the alternating current generator will break down any defective insulation.

pull up against the pole piece, the lever spring *m* lifting the upper spring *u* as shown at *D*. The tension of the latter spring against the stop *s* should be made as great as possible to insure a good electrical contact at the platinum *p*. Use a three volt buzzer circuit similar to that illustrated in Figure 17 to determine this.

3. Press key *C* and keep closed for at least two seconds. The armature should not stick in its drawn up position when this key is opened.

The line leakage which would tend to cause the relay armature to stick in its operated position is represented by the 10,000 ohm resistance permanently connected across the test circuit.

The manufacturers' shop tests are carried out in further detail. The springs are carefully tested for each stage of their movements and the battery connection reversed during the test so as to compensate for residual magnetism in the relay cores. Other things are taken into consideration, such as the impedence of the windings, as in this way short circuit turns can be readily determined. The resistance of the windings is also checked as well as the ability of the windings to withstand excess current without undue heating.

The ordinary tests for insulation between parts of the relays can be made with an alternating current of at least 75 volts (preferably 300 volts) and a 1,000 ohm ringer arranged as in Figure 18. A test is made from each terminal of the winding to the core of the relay, from each contact spring to the frame of the relay and from each

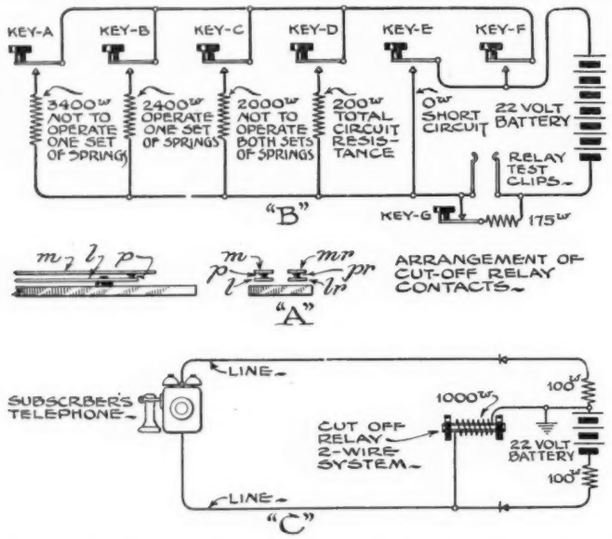


Figure 19—The portion of the illustration marked A shows the normal arrangement of the contacts of a cut-off relay, while B is a test circuit for adjusting this relay to work in a so-called two-wire common battery line circuit, such as shown at C.

contact spring to the other contact springs of the same group. In making the latter tests the normally closed platinum contacts should be opened temporarily by hand.

When the relay has more than one set of springs it becomes necessary to provide a more complicated test to be sure that each set of springs has its proper tension, as well as to determine the combined effect of the springs. For example, a cut-off relay with two sets of "break" contact springs, as shown at *A*, Figure 19, will require a test circuit similar to that shown at *B* of this same illustration. The tests would have the following sequence:

1. With the left hand lever spring *m* (see *A*, Figure 19) wedged in a raised position, press keys *A* and *F*. The right hand lever spring *m* should not break contact with its lower spring *br*. Use a three volt buzzer circuit, Figure 17, to determine this.

2. Press keys *B* and *F*. The armature should be now drawn up against the core opening the contacts at *pr*, the action being positive.

3. Repeat tests Nos. 1 and 2 for the left hand lever spring *m* with the right hand lever spring *mr* wedged in a raised position.

4. With both lever springs *m* and *mr* in their normal positions, press keys *C* and *F*. The combined tension of the lever springs should now be sufficient to prevent their breaking contact with their respective lower springs *l* and *lr*. Use a three volt buzzer circuit to determine this.

5. Press keys *D* and *F*. Contacts *p* and *pr* should both be opened, the action being positive.

6. Press keys *E* and *G* and keep pressed for at least two seconds. The armature should not stick in its drawn up position when these keys are released.

A shunt of 175 ohms resistance, across the terminals of the relay test circuit, is used to represent the condition of an actual exchange circuit, Figure 19, *C*, when the subscribers are connected for talking. This shunt could be omitted by making the other test coils of higher resistance so as to compensate for its action.

A spring contact relay having three groups of springs would be treated similarly to that of the last test excepting in each adjustment of an individual set of springs there would be two sets wedged up out of the way of the armature, instead of one set.

SELLING A TELEPHONE

By A. P. Reynolds

THE following dialogue between a telephone solicitor and a possible subscriber to the service of his company, may be found of assistance in inducing those whose should have telephones installed to sign contracts for service.

Solicitor—"Mr. Jones?"

Mr. Jones—"Yes."

Solicitor—"Mr. Jones, I represent the Citizens' Telephone Company, and I've called to see if we can arrange to place our service with you."

Jones—"Want to sell me a telephone, is that it?"

Solicitor—(Good naturedly) "To talk about it a little, at any rate, Mr. Jones."

Mr. Jones—"Well, I don't want a telephone; don't need one—wouldn't use it if I had one—all my customers come in when they want to buy or order anything. It may be all right, but I don't need it."

Solicitor—"You can't expect me to agree with you on those points, Mr. Jones, but I know you're fair and open to conviction. In the first place the telephone is the greatest convenience and time-saving utility ever discovered, for it can be placed at your elbow and it simply annihilates time and space. And were it the case that you never would use it, you must remember that others do—and it doesn't require as much time to take an order over the telephone as it does to wait on a customer in person. If your time has a commercial value, which it has, you can readily see that telephone service would help you in your business."

Mr. Jones—"But I don't need a telephone!"

Solicitor—(Seriously) "Now Mr. Jones, you're an intelligent business man, and I know you'll be fair under fair circumstances. Let us reason whether you do or not. I don't question but that you understand the grocery business from A to Z, but while acquiring the knowledge you have of it, you may have overlooked some outside points in connection with it that would result in increasing your trade, making your work lighter, and costing you less to conduct your business."

Mr. Jones—"Huh!"

Solicitor—(Smoothly) "Of course, Mr. Jones, I didn't come in to tell you how you should run your business—you already know how, and I have no desire to try to tell you anything about it—but while you have studied the grocery business, I have studied the telephone business, and it is only natural that we both possess knowledge of our particular lines which would be of considerable help to each other were we to exchange places. And it is this point I wish to make clear to you. If I can show you by reasonable statements that our telephone service will help you in your business, not only as a time-saving utility and a convenience, but as an advertisement and a 'business getter,' and will produce more profitable results for the amount invested than anything else you can add to your establishment, will you adopt it? That's fair, isn't it?"

Mr. Jones—"Yes, I guess it is."

Solicitor—"All right, Mr. Jones, let me take your own

business as an example. Here you have a store located in the midst of a hundred or more well-appointed homes from which you expect to and do draw on for trade. You have nice large display windows; your stock is well arranged and kept; you have a neat sign in front of your store with your name and business advertised; you also advertise in the newspapers and issue a weekly price bulletin; you have a delivery horse and trim wagon—in fact, you have and do many little good things other grocermen don't. There are persons who might consider them unnecessary expenses, but you know they're not, for your business shows a profit in proportion to your investment. You reckon that singly and collectively they bring you business. Am I not right in my deductions, Mr. Jones?"

Mr. Jones—"Yes, I guess they all help some."

Solicitor—"Of course they do, and no one understands that better than the man who is progressive enough to adopt up-to-date methods of getting business. Now, take the telephone. We have a service at $36.00 a year—that is, $9.00 a quarter, or $3.00 a month, or getting it down to the daily cost, it amounts to ten cents a day. Think of that, Mr. Jones, ten cents a day for our telephone service! And what can you invest a like amount of money in other than this service that will do as much for you; bring you business, give you publicity, run your errands. order your goods, help you cater to the trade you already have and reach out for more, save you needless steps, time and annoyance?

"Certain things are impossible, you know, Mr. Jones. You can't take ten cents a day and buy newspaper space; you can't have a card or sign made and changed once a week for that amount; you can't hire a clerk or a boy, nor keep a horse; a street car trip a day amounts to that much! Still, we'll furnish you telephone service for the sum I've named, put you in direct touch with nearly four thousand two hundred people who use our service—about half of this number are women who use the telephone to order goods, and a great many are in this community—publish your name and business in our directory—where it will be seen and read hundreds of times every day—and, in addition to all this. we put you in a long distance telephone that you can talk out of town should you be required or desire to do so. This for ten cents a day, Mr. Jones, and you know as well as I do that you couldn't get a man or boy to perform half the duties the telephone does for double the cost of the latter. Isn't it a fair proposition that you should try it."

Mr. Jones—"Yes, it's fair enough, I guess, if it will do all you claim for it."

Solicitor—"Well, Mr. Jones, I haven't stronger proof to offer than the fact that we have more than four thousand subscribers who are daily using our service to their advantage, some of which number have as many as four lines and a dozen telephones. And we are constantly adding new subscribers. People do not pay good dollars for worthless or valueless property. You wouldn't keep a horse that couldn't haul your wagon."

Mr. Jones—"You say it costs ten cents a day"

Solicitor—"That's right, ten cents a day, and that amount covers every thing, except any long distance messages you may have. We install the service free."

Mr. Jones—"Well, I'll think about it, and you come in when you're around this way again."

Solicitor—"All right. Mr. Jones, if you would rather think it over a few days, but it is a matter which really shouldn't require much thought. We don't wish to hurry you in the least, but every day you continue without one of our telephones you waste a great deal of valuable time, to say nothing of the orders you miss. Our telephone service is as essential to a well-kept store as cash registers and scales are. Of course we got along without both years ago—the same as we did street cars and railroads—but we wouldn't care to go back to those days."

Mr. Jones—"Yes, that's right, but, you see, it's this way with me: I've a boy and a clerk here who go 'round twice a week to my customers for orders, and if I have to go to another part of the city the street cars run every few minutes, or there's a telephone on the corner above my place—so, you see, I don't need it, after all."

Solicitor—"Yes, but, Mr. Jones, you must reckon the cost of your street car trips, and the man on the corner above has a telephone for his own use. You wouldn't allow him to come in your place to use your cash register, would you? Of course not! And just let me tell you something about going around for orders. It's a mighty good thing to do, I know, but the telephone we've been talking about plays a big part in the same work. Suppose your clerk calls on Mrs. B———, who is one of your best customers, and she gives an order for all she thinks she needs, but finds, shortly after your clerk has left her house, that she is out of baking powder and butter. She goes to her telephone to tell you to send it with the other goods, and discovers that you do not have our service. The result is that she calls a grocer who does have one of our telephones and orders the baking powder and butter. And the grocerman, being anxious to please a new customer, makes a prompt delivery and the butter he sends her happens to be a little better, she thinks, than the last she bought from you. What does this incident result in? Your competitor getting her trade! This is absolutely true, Mr. Jones, I know of several cases just like it in the past few months. A man to be successful in business should get all he can, and it ill affords you to allow a man in your same line to gain a point over you, however slight it may be."

Mr. Jones—"Yes, but I guess I won't lose many customers."

Solicitor—"But suppose you should lose only one customer! A new family moves next door to her, and the housewife asks your old customer where she buys her groceries. Of course she tells her, and also recommends him, perhaps relates the incident which caused her to change. Are you gaining or losing by not having our telephone service? Mr. Jones, there is every reason in the world why you should have one of our telephones, but we can't convince you of this so long as you do not allow your good judgment to direct you in the matter. Now, all I ask is that you be fair with yourself and with me. Your time is worth something and mine just a little. I have no desire to waste either. You need our telephone service. Every call we have for you (and we have a great many in view of the fact that you do not have our service) represents some one knocking at your door for admittance, and when our operators report that you do not have a telephone, it really means that you have placed a barricade against your door to keep customers out. Surely you do not realize the great amount of good our service would do you; yet you can't receive this 'good' until you provide for it. Were your door not large enough to admit the people who sought entrance to your store, you would soon enlarge the door. But, why not provide another entrance? Open your business on all sides. Give every customer that knocks a chance to enter, and let us help you to do this. Let us place our service in your store for one year. We do not ask you to sign an application for three or five years. Simply try it for one year, and if you find at the end of that period it has not given you back a dollar for every one-hundred cents you have paid us for it, order it removed. Act on my suggestion and try it. After you have had it a short while you would not do without it for many times ten cents a day. It is simply a matter of trying it and finding out its many advantages and great commercial value. Try it, that's all we ask you to do, Mr. Jones, and you are only being fair with yourself when you do."

Mr. Jones—"Well, go ahead, I'll try it a year, anyhow."

OPERATING METHODS

A Paper read before the Pennsylvania Independent Telephone Association at Allentown.

By A. J. Ulrich

IN speaking of operating methods, it might be of interest to compare present methods in use on central energy switchboards, or, as they are perhaps better known, common battery switchboards, with the methods that were used on Law switchboards, which most of the larger companies were operating prior to the adoption of the central energy system.

The Law system had a number of advantages. The arrangement of call circuits was such that the work could be distributed to a large number of operators, or condensed so that a few operators could handle it. This made it possible to handle the work with comparatively few operators at night, Sundays and holidays, when the traffic was light. It was an easy matter to train students how to operate, for the average student could hold a light position after having listened in on some regular operator for a few days. With this system a rapid service could be given, as the subscriber could place call instantly by pushing in a button, giving his number and number he wanted, which the operator would acknowledge having understood by giving a single stroke on his bell; this same method being used when subscriber called off, which he had to do in order to clear his and the called subscriber's line.

An operator could, with this system, operate for hours without it being necessary for her to say a single word, as the use of phrases in the handling of calls was not thought of, for the reason that there was no necessity for them. The disadvantages of operating this system, however, when compared with the present system, were many.

Subscribers would, in a great number of cases, fail to call off, and operators receiving a call for a subscriber who hadn't called off, would have to call to operator handling this subscriber's originating calls, to disconnect him. If a call circuit got out of order it would affect the service of every subscriber using this call circuit when placing a call. It frequently happened that a number of subscribers would call almost simultaneously and the operator, not being able to understand, on account of confusion of numbers, would get calls mixed up; as a consequence, subscribers would call almost simultaneous, and the operators would yell out number wanted, and keep on yelling louder and louder, and by so doing drown out half a dozen or more others who were trying to place calls, every one yelling to everybody else on the circuit to "shut up," and the like. This condition of affairs ended in such a rush of calls that the operator holding the circuit became so "rattled" that she had to be replaced by another operator for the time being.

Supervision of the work was only possible by listening in on the operator's position at the board, for this was the only way of knowing how quickly and carefully an operator handled the work, as there were no lamp signals to judge by, such as is the case at present. Notwithstanding the good features of this system, the disadvantages were of such a nature that those who had the matter in hand deemed it advisable to try and perfect a system whereby these disadvantages could be overcome.—and the central energy system was the result of their efforts.

The adoption of the new system revolutionized operating methods, and of a necessity so. It was soon found, in order to get best results, a uniform way of handling calls was necessary, and in order to bring this about at the earliest moment, a school for students was inaugurated, where students learned to use the proper phrases, object of supervision, markings on the board, and the like.

The best method of conducting a school for operators can only be decided by the results obtained, and as this branch of the work is practically still in the experimental stage, it is a difficult matter, at present, to lay down any hard and fast rules.

Some traffic men are of the opinion that the more a student is taught about the mechanical features of the board the better operator she will make, and have charts and diagrams in the school-room showing circuits, relays, etc. Whereas it is possible that there may be something in this claim, personally I don't think it is necessary for an operator to know the mechanical end of it at all, for I believe that those in charge of the operating branch of the work will agree with me that the best operators they know of have very little knowledge of circuits and the mechanical parts of a switchboard.

We think it best to have all applicants fill out an application blank in person, giving name, address, age, former employment and the names of at least two references; if former employment was with some telephone company; length of time employed; whether she worked on local or long distance boards, and the reason for her leaving. The applicant is advised that for the first week or ten days she will not get any pay, but if satisfactory progress is made by her at the end of that time, she will be placed on the students' pay-roll until such time as she is assigned to an exchange, whereupon she is transferred to the regular operator's pay-roll of that exchange. Applicants are examined as to height, reach and eyesight, a regular optician's eyesight test chart being used for the eyesight test. Applicant must be five feet four inches in height, must have a reach of twenty-nine inches and be able to pass eyesight test. If she doesn't meet these requirements at the time application is filed, she is so advised, but if she does, she is advised that we will notify her when to report. In the meantime, the parties she has given as references are written to, and if satisfactory replies are received, the application is filed until such time as a new class is formed, when applicants who have passed examinations, and whose references are satisfactory, are notified to report to the school for instructions. If an unsatisfactory reply is received from these she has referred to, the applicant is rejected, application blank marked accordingly and filed for future reference, in case the applicant should apply for position later on.

The school is in charge of an instructress who does nothing else but teach students. We have a separate room with two sections of multiple board so arranged that students can answer and complete connections. The course of instruction is about as follows: Students are first taught the location of the various groups of hundreds in the section, and then the individual numbers in these various groups. Explanation of what is meant by sections, panels, positions, answering jacks, trunk jacks, multiple jacks, and why they are termed such, answering keys, ringing keys, answering and connection cords, and the proper use of same, and the object of pilot lamps. It is then explained and shown how the subscriber calls the exchange, and what phrases are used in handling calls; how

and why a "busy" test is made; how long to ring if line tests clear; how to handle call if number in some other exchange is wanted; proper use of call wires; that numbers called for must be repeated back to the subscribers by spelling figures, and with a rising inflection as though asking a question, and not to repeat and instantly cut out, but to wait a moment so as to give subscriber a chance to correct her if she repeated back the wrong number; the meaning of markings on the board, and different colored lamps are then explained; what is meant by flat, measured and pay station service; are tested for speed in picking out correct numbers in the multiple; are advised as to the rules governing operators while in the operating and retiring rooms. Students are then examined in all of the foregoing instructions and, if satisfactory, are then assigned to the various exchanges, and placed on some of the lighter positions. If a student hasn't progressed enough at the end of a week's instruction to indicate she has the qualifications essential towards the making of an operator, she is dismissed from the school.

When a student is placed at an exchange, a card and folder are made out, which card shows on one side her employment number, exchange assigned to, and an operating number, which she is advised of, and which she is instructed to give instead of her name when asked for over the wire, either by subscribers or service inspectors, name, address, by whom recommended, former employment, age, height, sight, reach, date employed, and at what rate; has spaces left blank on which are marked dates when salary was increased, what her present position is, when transferred from one exchange to another, on what date she was promoted (if such should be the case), date of dismissal, date of resignation, and cause of such dismissal or resignation. On the back of the card are marked date and number of times operator was absent or tardy while in our employ. Folder and card are sent to the district manager, who keeps this record while operator is employed in any of his exchanges, and upon operator being dismissed or resigning, notes date of dismissal or resignation, cause of same, and sends folder back to the traffic manager's office to be filed.

In addition to card, a deportment blank is also enclosed in the folder, on which is kept a record of the number of times the operator had to be reprimanded in regard to her work, attendance or deportment. These records are referred to by the district managers when the question of increasing the operator's salary comes up, and we believe that by this method of keeping operators' records we are in the best position to know which operators are deserving of increases, and those that are not.

As various branches of the work are embodied under the heading of traffic work, we have a head for the various branches, and our organization for the department is as follows: The Operating Department; Service Inspection Bureau; School for Operators, and Clerical Department.

The operating branch is divided up into districts, and comes under the direct supervision of a district manager. The district manager's duties are to see that there is a sufficient number of operators in his exchanges to handle the work; to see that all instructions sent out from the traffic manager are complied with; to follow up complaints; to ascertain whether they are due to operating or other sources; to see that the work on the board is evenly divided; to have at least fifty supervision tests made monthly on every operator in their exchanges. These supervision tests are made by whom the district manager appoints for this work, one time it will be a chief operator, another time a supervisor, and so on. Whoever does the supervising notes down on a form, which is gotten up for this purpose, the number called, and any irregularities, such as:—"Operator asked for number more than once" (whether it was the fault of operator or subscriber), "Did not use rising inflection", "Did not repeat number", "Connected with wrong number", "Failed to make proper busy tests", "Connected over the busy", "Premature disconnects", "Poor supervision", etc. The results of these supervision tests are then turned over to the district manager, after which they are filed in the operators' individual folders. District managers must maintain good discipline at all times, and keep the traffic manager fully advised as to the need of more trunking facilities, not only with the various exchanges, but also with the private branch exchanges in his district, so that the private branch subscriber can be seen and advised as to the amount of traffic handled on his private branch trunks, with the object in view of possibly getting the subscriber to have additional trunks placed, which would be the means of giving not only the subscriber, but those who do business with him, a better service. The district managers are expected to be thoroughly in touch with the work in their districts at all times, so that any changes which, in their opinion, would tend to improve the service, can be submitted at the monthly meetings, where the matter is gone over thoroughly, and, if feasible, approved.

The district managers are required to hold at least one meeting a month (or more, if necessary) with their chief operators and supervisors, and take up the work in detail, the results of service tests in their districts, and in short, anything else concerning the service that they deem advisable.

The service inspection bureau is in charge of a chief service inspector whose duties are to arrange schedules for the day, evening and Sunday tests in the various districts, and arrange a subscribers' list in these districts in order to aid the service inspectors when making tests. These service tests are noted on little blanks in pad form by the service inspectors, while making the test, then when tests are completed and inspectors return to the office, they fill in a regular form provided for this purpose, showing the time and what subscribers' telephones the tests were made from, time it took the operator to answer, both on originating calls and re-calls, and note in the "Remarks" column any irregularity, such as wrong phrases being used, or failing to repeat numbers, poor supervision, and the like. In addition to noting this, they work out a per cent of the number of calls answered in four seconds or better, also those that are answered in eight seconds or better.

These tests are then entered on the monthly report record and turned over to the traffic manager, who marks criticism of the test, if any, on report, which is then sent out to the district manager in whose district the test was made. Results of these tests are then gone over by the district manager with the chief operators, supervisors and operators concerned, as they can tell from the report just what operators gave the long answers, for at the time the test is made, if a call is not answered until ten seconds have elapsed, the inspector ascertains from the chief operator the number of the operator who handled this particular call, which is noted on the report, and serves as a means of identification when these reports are sent to the district manager for his explanation of any long answers or irregularities in the handling of the work in his district.

This department handles all complaints from the subscribers relative to service. A record is kept of whether the complaint came in by letter or telephone. When the general manager's department receives a letter of complaint there is a series number stamped on the letter and it is charged up to this department, who acknowledges having received it by signing a slip having a corresponding number to that on letter of complaint. This complaint is then gone into, and if it is of such a nature that the trouble complained of might be due to maintenance, a slip is made out and sent to the maintenance department to have

the line and instrument gone over. The original letter is sent to the district manager, who follows up the complaint and ascertains from the maintenance department whether any trouble was found, and if so, marks same on his report, calls up the subscriber and explains cause of trouble. If the trouble is found to have been caused by poor operating, this is also noted, and the matter taken up with the operator handling this subscriber's calls, and the subscriber kept in touch with for a few days to see if there is any improvement in his service. At the time of receiving complaint, a record is also entered on a form, which shows from what subscriber this complaint came, nature of complaint, and also to whom the complaint was referred. When these reports come back from the district manager, if he is of the opinion that it would be advisable to have a special service inspector see the subscriber in person, the district manager so specifies on his report. This is generally found to be the case on two-party trouble, and on such subscribers' lines where there are one or more extensions on the line. The special service inspector then makes it a point to explain cause of trouble to subscriber, as, for example on two-party complaints the trouble may be due to some one trying to use the line when the other party is using it, or how a "busy" report could be given on the "D" party's telephone while "A" was using it, without "D" having used the telephone for several hours, and the like. The special service inspector then turns in his report, which is entered on the monthly sheet, showing the handling of the complaint from the time it was received until it was cleared to the satisfaction of the subscriber. All service complaints on which investigations have been made and closed are then sent to the record department to be filed in the subscribers' individual folders, and in this way a complete record is kept from the time the subscriber's telephone is installed.

In such cases of complaints where it is found a matter for the adjustment agents to take up, this is noted, the date on which it was referred to the adjustment department is recorded, and as far as this department is concerned the case is closed. By this method we can, at the end of the month, give a history of every complaint, the number of complaints, whether received by letter or telephone, what department they were referred to, and what department was at fault, whether operating, maintenance, distribution, cable, etc.

A monthly report is also made up of the result of the service tests, the average being given on day, evening and Sunday tests, according to exchange, and ranked according to merit, both as to originating calls and recalls. This enables us to see whether the answering of calls in any particular exchange is falling below the average, and if it is found that this is the case, the matter is taken up with the district manager concerned.

A monthly report of the number of complaints and the results of the service testing is made up from these records and forwarded to the general manager.

It is this department that has charge of interviewing and employing applicants for operating positions, also the compiling of all reports concerning the operating division.

The clerical department is in charge of a chief clerk. Here the directory is compiled and prepared for the printer. The assignment of subscribers' numbers (other than those of party lines) are made in the clerical department and noted on traffic plots, showing lines according to positions and class of service. The work of summarizing the monthly peg count as sent in by the district managers is also done in this department.

The reporting of trouble by the various exchanges is so arranged that in addition to making out a regular maintenance trouble slip, it is also noted on a chief operator's trouble report, and any cases that are still out of order five hours after having been reported, are specially noted. A report is telephoned to the traffic manager's office every morning at eight-thirty, giving the number of employees absent, amount of trouble reported and not yet O. K., according to lines, instruments, switchboard and trunks per exchange; also the number of cases that are known as "left over trouble" from the day previous. This report places the traffic manager in a position to ascertain the amount of trouble in any one exchange, and if above normal, arrangements can then be made so that the service can be handled to the best advantage until the trouble is cleared.

It is essential, in order to give good service, that the various branches of the department work in harmony, and this can only be brought about by adopting and carrying out systematic methods.

I do not believe that there are any two Independent companies operating alike, as far as the traffic work is concerned, and this no doubt is due, in part, to local conditions that have to be considered. It is believed that a great move in the right direction will have been made when the Independent companies adopt a standard for their construction, switchboards, circuits and equipment, and this being true, why would it not also be a step in the right direction to have a standard set of operating rules and regulations?

I was informed that at the National convention held in Chicago, a committee having the matter of standard operating rules in hand, had submitted a report covering this subject. Whether these operating rules are such that they can be applied to all companies, is a question that I am not in a position to answer. However, I sincerely believe that when such a set of rules is compiled and adopted by the various companies, the result will naturally be a general benefit to all patrons of the Independent telephone companies.

TELEPHONES IN GREECE.

According to Mr. Horton, the United States consul at Athens, ancient Greece needs an up-to-date American telephone system. The inhabitants of that country are dissatisfied with the slipshod policy of the government which controls the telephone service. Consul Horton reports:

"The appliances in use are inadequate and the service unsatisfactory. For this reason the telephones are but poorly patronized, and I am informed on good authority that they are an unprofitable investment to the government, which controls them. It is probable that the government would grant a concession to some reliable private company that would install up-to-date effective telephones. I am confident that this bright, progressive people is ready for such a telephone service, and would support it with their patronage. The value of the present plant is about $125,000. The French Adder system is in use, with German keyboards. There are at present only about 600 telephones in operation at Athens, Piræus, Phaleron, Kephissia, Decelia, and one long-distance wire connecting Athens and Patras.

"The present charges are 100 drachmas (drachma equals 19.3 cents) a year for a local telephone, 250 drachmas where connection is made between cities, and drachma for five minutes' talk between Patras and Athens. Salaries paid to operators range from 120 to 400 drachmas per month. Here possibly may be a profitable opening for American capital, as there seems to be a very general desire on the part of the people, which I have heard frequently expressed, that 'the Americans would come and take hold of the telephones.' For the granting of this and all similar concessions a vote of parliament is needed, sometimes easily obtained, and in other cases only after many and elusive promises and long and exasperating delays."

SUGGESTIONS FOR TESTING TOLL LINES

By E. P. Gray

LOCATING AND CLEARING TROUBLE ON TOLL LINES IN GENERAL.

MAKE sure that no arresters on line are causing trouble. Never send man out on line before ascertaining that the trouble is outside of the city or town limits from which you send him.

Always save expense when possible. This is a matter of judgment. Where service is greatly injured by lines remaining in trouble a greater expense would be permissible when judiciously incurred, thereby saving time.

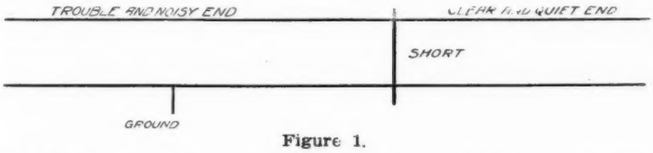


Figure 1.

Do not cut wires. When wishing to open a circuit open at arrester or test connectors.

Always use a No. 12 tie wire when shorting a line and be sure connection is perfect.

DETAILS FOR LOCATING AND CLEARING GROUNDS.

Short circuit the line as near the center as possible and then listen on either end. The noise will be found to be on grounded section of the line. Remove the short circuit and short circuit the line at different convenient points successively until you have located the ground reasonably near to either end.

Open both sides of the line at the arresters or test board at further end, and listen on each side of the line on your end separately with a ground on your instrument. If the ground is at all near you, you will get less noise on the grounded side of the line. After this leave your end open and have the station at the other end make the same test if possible. If not, you will have to rely upon your own test.

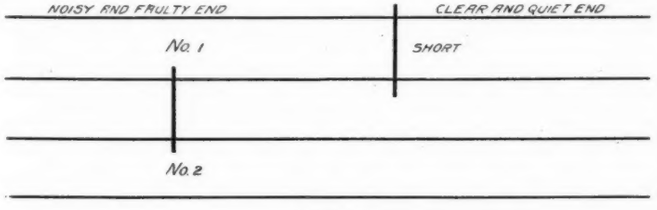


Figure 2.

Have a short circuit put on the line at the further end, and if this cuts the noise off for you it is at the other end; if it reduces it by one-half, you can count on the ground being half-way between you and the further end. This test should be made from both ends when possible. See Figure 1.

FOR OPEN LINE OR LOOSE CONNECTION.

Short circuit the line as near the center as possible, and then listen on either end. The noise or open circuit will be found to be on the noisy or open end. Remove this short and short circuit the line at different convenient points successively until you have located the noise or open reasonably near to either end.

Open both sides of the line at the further end and listen on each side of the line at your end separately with a ground on your instrument. If open or loose connection is at all near you, you will get less noise on the wire that has the fault if it is an open; but you cannot tell so well if the trouble is a loose connection unless it is practically open.

FOR CROSSES BETWEEN TWO OR MORE CIRCUITS.

Suppose that No. 1 circuit is crossed with No. 2 circuit. Short circuit No. 1 line as near the center as possible, and have some one talk or ring on No. 2 line, and if the cross talk or induction is noticeable on the other end of No. 1 line and your end is quiet, the lines are crossed between the short circuit and the other end. Make similar tests on the faulty section until you have located the trouble reasonably close to either end.

Open both sides of both circuits at both ends of the line at arresters or test board—find the wires that are crossed, and you can tell how near the trouble is to you by the strength of the ring, or by the pull of the generator. If your bell or test is an 80 ohm series it will ring good. If the test is made with 1,000 ohm or bridging set your bell will not ring on 100 ohm or less short circuit or cross. If the cross is between you and the center of the line you will get less noise when listening metallic on the two wires of the two circuits that are crossed than you will get on either circuit that is crossed. See Figure 2.

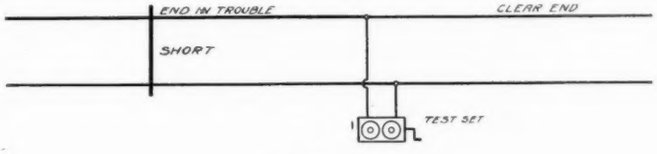


Figure 3.

FOR SHORT CIRCUITS.

If possible have some one get onto the line and try to ring you, and if you get his ring on your line drop, ring off drop or bell, the trouble is between him and the other end. If the trouble is on the other side of him and within a few miles (say 10 miles of No. 12 copper) he will not be able to ring you. If possible have him stay on the line while you get a connection around and talk to him from the other end. If you cannot talk to him from the other end the short circuit is between him and the other end. See Figure 3.

FOR OPEN CIRCUIT.

Have both sides of line opened at fuses or test board at other end, and listen at your end with a ground on one side of your instrument, you will get induction or noise on the side that is open in proportion to the length of the wire of said side up to the break compared with the induction you will get on the good side.

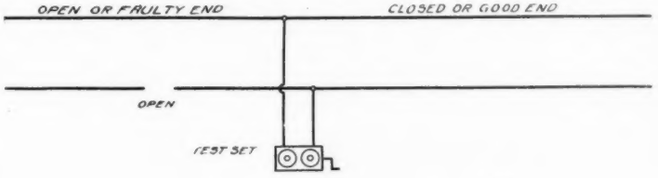


Figure 4.

Have some one near the center of the line ring—the line will be open between him and the end that does not get his ring. See Figure 4.

DIGEST OF TELEPHONE PATENTS

By Edward E. Clement

831,131. Multiconductor Cable; Yeatman. Each pair in the cable is differentially wound, one pair with a right hand turn and the other pair with a left hand turn. Both pairs are then twisted together and suitably encased. A plurality of these units is included in one cable for the purpose of doing away with interference on the line. Patent assigned to the American Telephone & Telegraph Company.

831,348. Telephone Receiver Support; Howe. This is a bracket for the support of the receiver and the transmitter and is so made that the adjustment of the receiver with respect to the position of the user's ear is rendered very easy. Patent unassigned.

831.364. Selector or Lockout for Party Lines; Marchand. In this system there is a plurality of cylinders, one at each substation, which rotate step by step so that the proper station may be selectively connected with the central station. Each station is provided with a key which when depressed for selecting retards the motion of the cylinders at all other stations so that they will be effectually locked out. Patent assigned one-half to James B. Valentine.

831,525. Composite Telephony and Telegraphy; Rugh. Each substation in this system is provided with a shunt around the receiver of low ohmic resistance but of high impedence, so that telegraph currents may find their way around the telephone without in any way interfering. Patent assigned to Western Telegraphone Company.

831,819. Telephone System; Bell. This system employs a relay which is used as the line indicator, the impedence coil, and the clearing out indicator, and may also be used as a self-inductor for special calling apparatus. Patent assigned one-half to Isidore Bernard Birnbaum.

831,846. Automatic Telephone System; Erickson. The vertical line relay and the rotary line relay are bridged across the subscriber's line to which the switch is allotted. There is means to prevent the operation of these relays when current is thrown upon the line to ring the subscriber's bell, without the necessity of either cutting off or opening up the connections by which the relays are normally bridged across the circuit. Patent assigned to Automatic Electric Company.

831,855. Telephone Transmitter Arm; Guttman. This arm is composed of two complimentary half sections stamped out of sheet metal and forming a hollow arm or shell having a cup or enlarged socket constituting the transmitter casing. The inner end is formed to constitute one-half of a ball and socket joint by which it is attached to the support. Patent assigned to the Automatic Electric Company.

831,875. Interrupter for Automatic Telephone or Other Switches; Keith. The magnet or magnets used for operating the switch shaft in a step by step movement also effect an intermittent opening and closing of the circuit through which current is supplied to said magnet or magnets, whereby they are alternately energized or de-energized for the purpose of rotating the switch shaft. Patent assigned Automatic Electric Company.

831,876. Switching or Telephone System; Keith. The arrangement of this system is such that any additions may be made at any time without in any way interfering with the apparatus which is in use, and the wiring is such that an equal distribution of work or load is obtained. Patent assigned to Automatic Electric Company.

831,889. Telephone Attachment; Patterson. This is a cap adapted to be secured over the transmitter mouthpiece and is provided with a valve to close the opening therein so that conversation not directed to the party with whom connection is made, may be excluded. Patent unassigned.

832,121. Telephone System; Dean. The line relay in this case is provided with two windings and controls the line signal lamp through its armature and one winding thereof. Patent assigned to Kellogg Switchboard & Supply Company.

832,135. Combined Telephone Receiver and Microphone; Ljungman, Berglund and Hjorth. This is a combined transmitter and receiver with the carbon button and the magnets of the receiver suitably mounted in the same casing. Patent unassigned.

832,425. Intercommunicating Telephone; Schmidt. In this invention the switch is mounted directly in the base of the desk stand and travels over a plurality of radially arranged contacts to connect the different telephone lines. The switch spindle is common to all lines. Patent unassigned.

832,443. Telephone System; Arnheim. A clock-operated selective system in which the mechanism of the clock is included in a branch circuit so that a signal can be sent to the call station over a switch circuit. A hook at the substation releases the clock mechanism, rewinds it, and resets the switch. Means are provided to lock out any other station on the line. Assigned to the Firm of Telephon-Fabrik Actiengesellschaft, Vorm. J. Berliner, of Hanover, Germany.

832,562. Telephone Call Box; Van Wagenen. This is a call box for automatic telephone systems and comprises a make and break wheel controlled by a button centrally arranged with an indicating disk. The switch-hook in this sender returns the part to normal when the receiver is hung up. Patent unassigned.

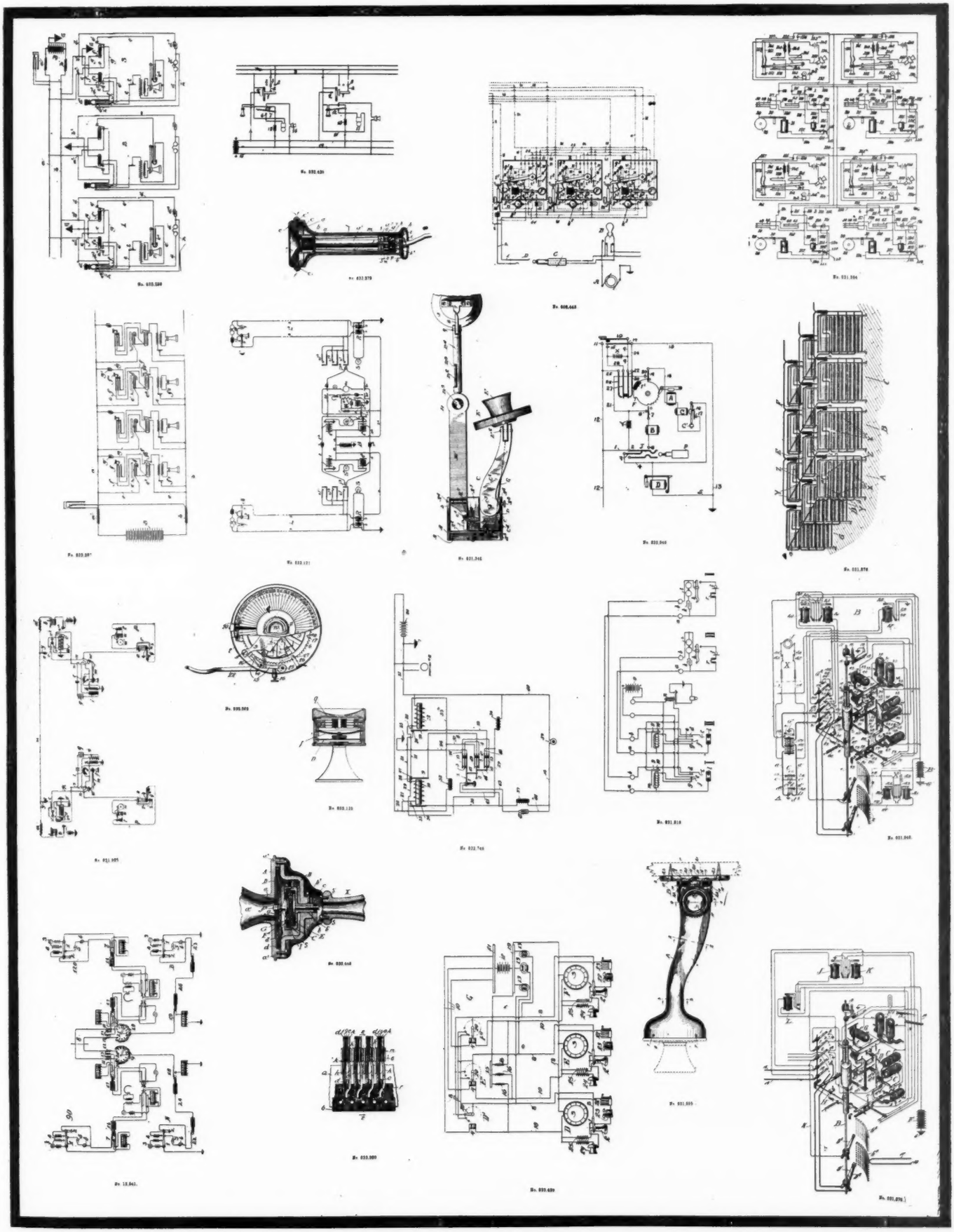
Reissue 12,541. Telephony; Rugh. In this system a rheostat is employed for effecting compensation for variation in the resistances in the metallic sides of the circuit that is designed to complete both telephonic circuits. The rheostat is employed in the loop circuit with the metallic circuit so as to include more resistance in one side and exclude resistance from the other side of the line. Patent assigned by mesne assignments to Edward C. Hennis.

832,746. Telephone Circuit; Phillips. The talking circuit at each substation in this system is provided with a relay having two armatures and retardation coils on each side of the line. A supplemental circuit is provided, which when closed prevents the operation of relays at other substations and thereby disconnects them for talking purposes. Patent unassigned.

832,946. Automatic Release for Party Line Exchanges; Anderson and Hagstrom. In this system there is a release magnet which is operated automatically upon the withdrawal of the operator's plug from the jack so that in case she should fail to send a restoring impulse it would be sent automatically without any special effort on her part. Patent assigned one-third to John Anderson of Salina, Kan.

833,279. Telephone Receiver; Albright. In this receiver the permanent magnet is provided with a terminal rack at its end which projects through the cord end of the receiver and is covered by a cap which has a threaded connection with the terminal rack. Patent assigned to Western Electric Company.

833,297. Lockout System for Party Line Telephones;



Bruce. Each subscriber is provided with a circuit closing device which bridges a relay across the line and closes the subscriber's instrument in a shunt around the relay. The bridging of the subscriber's instrument in this additional or shunt circuit absorbs so much current that it is impossible for any relay at another substation to operate. When the subscriber desires to call another party on the same line, he depresses a key which bridges his instrument directly across the line. Patent assigned by direct and mesne assignments to the Select Telephone Manufacturing Company.

833,298. Lockout System for Party Line Telephones; Bruce. This system is similar to the one just described, except that he uses two circuit breakers at each substation which do not complete the talking circuit until both have been operated. Patent assigned by direct and mesne assignments to the Select Telephone Manufacturing Company.

833,390. Spring Jack for Telephone Switchboard; Holmes and Craft. The mounting plate consists of a metal strip upon one side of which is mounted an insulating face strip in which is mounted the test thimbles having rearwardly projecting ends which serve as terminals. Patent assigned to Western Electric Company.

833,429. Automatic System of Intercommunicating; Wagenen. The automatic switches for selecting in this system have a magnet permanently bridged across the subscribers's circuit and a common source of electrical energy in common with the bridged connections of the magnets. Patent unassigned.

833,449. Telephone Transmitter; Duvall. In this transmitter the carbon button has an insulating ring upon which rests the supplemental diaphragm. This ring is threaded so that the cap which holds the supplemental diaphragm in position may be threaded thereon and to the cup. Patent unassigned.

THE TRANSMITOPHONE

An Ingenious Invention Wherein the Telephone is Used in Entertaining.

By Earl C. Long

SINCE the beginning of the Independent movement the telephone has been so popularized that it has revolutionized the methods of communication in social and commercial life practically over the entire civilized world, but until very recently it has been impracticable to use but one instrument by more than one person at a time. The introduction by the International Telephone Manufacturing Company, Chicago, of the new transmitophone, which enables communication with a large audience from a distant point, has opened a field which may be developed for entertainment purposes as well as for commercial usefulness to an extent almost without limit. One of the best demonstrations of the possibilities in this direction has been made this season at Riverview Park, Chicago.

The equipment consists of a sending station, located in

Figure 1.

one of the offices in the casino at one end of the park, which is connected by wire with three reproducing instruments, situated in different parts of the garden about thirty feet up in the trees. There was also used an accompanist's circuit arranged to enable the soloists to hear the orchestra in the garden. Figure 1 shows the garden with one of the reproducing instruments suspended in the tree at the right of the center of the picture, and Figure 2 shows two of the instruments as used. The reproducing instrument consists of a telephone receiver specially adjusted for this

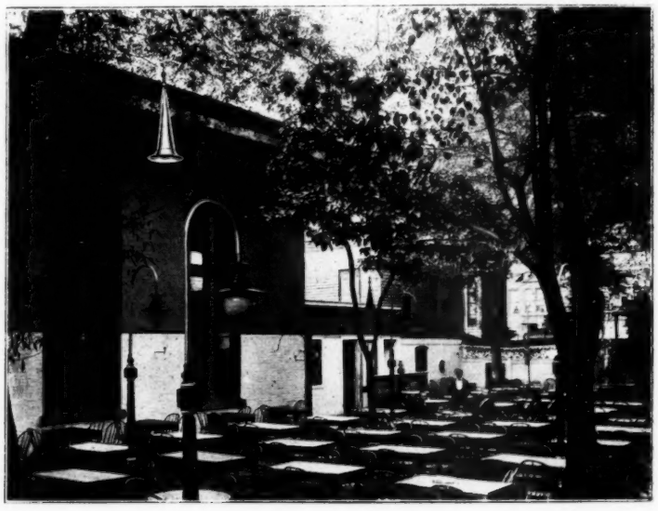


Figure 2.

class of work and provided with a large megaphone centered in the ear piece. Rubber covered wire is used for connecting the reproducing devices with the sending station. The wire is run directly into the receiver and covered with rubber tape to prevent moisture entering the working parts. The accompanist's transmitter is suspended in the orchestra stand, as is shown in Figure 3, at the left of the piano.

This transmitter is highly sensitive and is connected by a separate circuit to the sending station with the soloist's head receiver.

Figures 4 and 5 show the sending station, which consists of a local battery portable desk telephone with necessary switching device and batteries. For this class of work

eighteen volts or twelve cells of "1900" dry batteries are connected directly in the circuit through the one ohm primary side of the induction coil, through the transmitter, back to the battery which completes the primary circuit. The reproducing receivers are connected on what is known as a closed secondary circuit, that is to say, both terminals of the secondary winding are connected to the receiver or

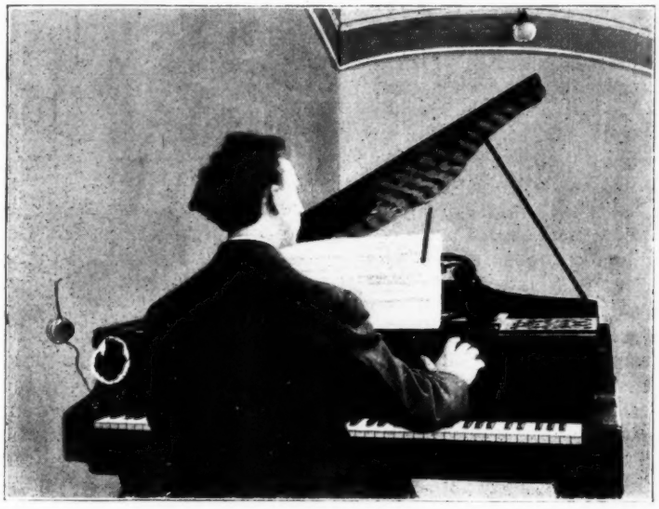


Figure 3.

receivers. The switching box in this installation is equipped for three reproducing circuits, consisting of three cam lever keys, and arranged so that the transmitting circuit can be switched to any one of the three receivers or to any two, or to all three at one time. The switching box is also provided with binding posts and terminals so that the various circuits may be readily connected. The battery box is a neat quarter-sawed oak case arranged for the capacity of two sets of eighteen cells "1900" batteries, with each set connected in series and arranged so it can be connected in the circuit with 12, 18 or 24 volts to meet the necessary re-

Figure 4.

quirements depending on the nature of the work desired to be accomplished.

The batteries are connected to a spring jack so that connection with the telephone circuit can readily be made with a cord provided with connecting plug. The accompanist's transmitter circuit at the sending station is also provided with a spring jack, so that the head receiver can readily be connected with a cord and connecting plug and in order that the transmitter may be promptly disconnected when the instrument is not in use. The transmitter is so constructed that with twelve cells of dry battery in the primary circuit it transmits vocal or instrumental music to the receiver with megaphone attachment, vibrating the receiver diaphragm so that the music can be heard from the instrument as loudly and clearly as if the soloists were singing or playing at the receiver. The working parts are so accurately made and adjusted and the diaphragm is so evenly dampened that the blast of a cornet is transmitted as distinctly as the soft, sweet voice of a lady singer.

Though one transmitter has been in use the entire summer season and at each evening's entertainment, and, while when continually used for fifteen or twenty minutes it would become so heated from the heavy battery current that one could not bear to touch the shell of the transmitter, it has shown no signs of deterioration whatever, thus clearly demonstrating the practicability of the instrument for work of this kind or for any service where it is desired to communicate with a large number of people at a distant point,

Figure 5.

or over a broad area. The entertainment was one of the most attractive features of the evening musical program. The megaphones were painted black and suspended in the trees above the lights so they were not easily seen. Many believed that soloists were concealed in the trees, and some ascribed the sound to ventriloquism or supposed that it was an echo of some powerful instrument. What was most mystifying was that the music came from different trees at intervals during the same selection and kept perfect time and tune with the orchestra. Very few believed that work of this kind could be accomplished by the use of a telephone. This instrument not only developed a new form of entertainment, but also demonstrated the efficiency and durability of the telephone transmitter as made at the present time for the Independent telephone field.

Telephone stations have been installed along Park Heights avenue, Baltimore, for the special officers assigned to look out for violators of the automobile law. The purpose of the telephone stations is that one officer may telephone ahead and order the arrest of an automobilist who refuses to stop when called upon.

DECISIONS AFFECTING TELEPHONY

By Gilbert W. Hand

USE OF STREETS IN MISSOURI FOR TELEPHONE POLES IS A LEGAL USE, BUT A MONEY CHARGE FOR THE RIGHT MAY BE IMPOSED.

IN 1898 the city of Lancaster, in the above state, entered into negotiations with Robert W. Briggs and Winfred Melvin which culminated in an ordinance being adopted by the city conferring the following rights on these parties: "A right, franchise and privilege to erect, maintain, operate and use a telephone system for a period of twenty years within the present and corporate limits of the city—upon the following conditions: in consideration of the grant of the franchise herein stated, the said Briggs and Melvin . . . agree to pay to the city two per cent per annum of the gross receipts collected from the use of said telephone system, the same being payable quarterly . . . The parties to whom the franchise is hereby granted shall have the right to use the public streets and alleys, highways and public grounds of said city for the erection of poles and wires and all other necessary appliances for the successful construction and operation of said telephone system." Maximum rates of charge were also provided in the ordinance. The court said in commenting on the legality of the ordinance that the use of the streets and alleys of a city to carry the pole lines and wires necessary to the operation of a telephone exchange is a proper and legal use, citing the case of Plattsburg v. Telephone Company, 88 Mo. 306, but that such use is subject to regulation by the municipality and the power to regulate carries with it the power to impose a money charge as a condition to the enjoyment of the right.

There was dispute over the right of the city to collect the two per cent tax on amounts collected by the company from rentals received from certain long distance services with which the defendants had connection; the city claimed that the ordinance included two per cent of all moneys received by defendants. the latter that it had reference only to the moneys received within the present or future corporate limits of the city. The court said: "An ordinance accepted and acted upon by its grantees, which provides that in consideration of the granting of the right to use the public streets the grantees are to pay to the city a stated percentage of the gross receipts derived from the conduct of their business, does not impose a tax; but, as was said in the Plattsburg case, is to be construed as a rental or sale of necessary portions of the streets of the city for a specified time for the purpose of carrying on a business in which defendants had a right to engage. The charge imposed is not to be regarded as a demand of sovereignty, but as a demand of proprietorship." And referring to the franchise: "Evidently it was not intended that the charge provided should apply to proceeds received by defendants from the operation of telephone lines or exchanges outside the present or future limits of the city. This clearly appears . . . and leaves no doubt that the city agreed to restrict its charges to the earnings . . . within the corporate limits. . . . But it is also clear that the parties intended that the earnings from all sources of the system within the city should be included." The court then went on to say that the two per cent should be applied to that portion of the long distance rentals actually earned and due to the use in such long distance service of the defendant's exchange within the city. This would be the ratio of the earning power between that part of the system within the city and that without the corporate limits.

City of Lancaster v. Briggs, 96 S. W. 314.

PROOF THAT TELEPHONE INSTRUMENT CONTAINED DEADLY CHARGE OF ELECTRICITY CASTS BURDEN ON COMPANY OF SHOWING THAT IT WAS NOT NEGLIGENT.

A case from Pennsylvania recently decided by the highest court of that state contains an important ruling on the above proposition. The facts were that one Delahunt's telephone had in some manner become out of order and had remained so for some days. He had received a notice from the manager of the company that the telephone would be repaired as soon as possible and was waiting until he could use it again. One evening he heard a sharp clicking of the instrument, and thinking that it had been repaired, went over to it and with both hands lifted the receiver from the hook when suddenly there was a flash and Delahunt fell lifeless. The above proof constituted practically all of plaintiff's case. No testimony was offered by the defense, thus raising the question whether under such a state of facts the defendant is required to prove that it was not responsible for the accident; in other words, whether under such a showing the presumption is that the company was or was not at fault. To the writer this is a question of great importance, as it can readily be seen that the burden of proof in negligence cases of this sort will be shifted one way or the other depending on the conclusion given. The following quotation from the decision of Justice Brown, who wrote the opinion, is sufficiently clear to need no further comment: "Electricity is the agent by which telephones become the means of communication from one point to another, and it may be conceded, as the appellant contends, that the current needed for their use is not a dangerous one. In this case it may be still further conceded that the current with which the deceased came in contact did not come from the exchange of the defendant company; but at the same time it cannot be questioned that it came over one of its wires leading to the telephone of one of its patrons. Though the wire was intended to conduct only a harmless current, the defendant was bound to know that it could become the conductor of a deadly one, and that such a current would pass over it if it was not properly insulated, and should come in contact with a wire heavily charged. Its duty to its patrons was to exercise at all times the highest degree of care and vigilance to protect them from a dangerous electric current over its wires from any source. This is the implied undertaking of every telephone company, and in towns and cities threaded with dangerous electric wires the duty of the company is, by constant supervision of its wires, to prevent their becoming conductors of a dangerous current from others. When they do become conductors of it, there is reasonable evidence that there has been a neglect of duty, and the burden is cast upon the telephone company of showing that it had not been negligent. As it is not an insurer of its patrons against the danger of electric currents on its wires, the law will not hold it responsible for what it cannot help and for what may happen in spite of its exercise of the care and vigilance required of it; but when . . . there is an accident, which in itself affords reasonable evidence of negligence, it must show why it should be relieved from liability."

At the trial the company asked that it be relieved from

liability on the ground that the deceased having admitted that he heard the click of the instrument had a warning of danger. The supreme court said that this position might be tenable if the current ordinarily carried over a telephone wire were dangerous, but since the fact is otherwise Delahunt did nothing that in law could be considered contributory negligence and that the defendant could not escape responsibility on this ground. A verdict for $10,175.89 was therefore affirmed. While there is nothing in the case tending to establish that the company was in any way at fault its inability or failure to prove affirmatively that it was not cast upon it the responsibility of paying this enormous verdict.

Delahunt v. United Telephone and Telegraph Company, 64 Atlantic 515.

TAXATION—SPECIFIC AND AD VALOREM ON THE SAME PROPERTY.

What amounts in practice if not in theory to double taxation upon the property of the Cumberland Telephone & Telegraph Company by the city of Nashville has lately been upheld by the Tennessee courts. An ordinance granting a franchise to the telephone company to construct and operate its plant and the right to maintain its poles and wires in the streets, contained a provision that the company should pay to the city annually a stated sum for each box in use by it, "in lieu of all other taxes except water tax." The constitution and statutes of the state provide that the city has no power to exempt property from ad valorem taxation and expressly prohibited the city from doing so. Plainly, under the latter laws the ordinance granted to the telephone company conflicted and from this standpoint would be void. The United States Circuit Court of Appeals, sixth circuit, found a way to affirm the validity of the ordinance by invoking the rule that a municipality may add a license tax on poles and wires for the purpose of defraying the expenses of police supervision, declaring the law to be that the taxes collected under the ordinance should be considered as collected for this purpose. There is also another familiar rule of law that when an ordinance is capable of two constructions, one of which would make it valid and the other void, the former is to govern. Hence the decision that notwithstanding the city had entered into a contract that the company should pay only a specific tax, nevertheless the state law having expressly ordered all property to be assessed on an ad valorem basis, the company must pay both taxes.

Mayor of Nashville v. Cumberland Telephone and Telegraph Company, 145 Federal, 607.

NEGLIGENT STRINGING OF WIRES.

The Hudson River Telephone Company had certain telephone wires strung from a wooden building over electric light wires. The building supporting the wires burned, allowing the telephone wires to rest on electric wires, whereby a dangerous current of electricity was carried over the sagging wires, and as a result injury occurred to a fireman, who sued both companies for damages. The New York court held it a matter for the jury to determine whether under the circumstances the company should have taken notice of the fact that the buildings supporting its wires was liable to burn, thus allowing its wires to drop on the electric wires; that while eight feet of distance between wires passing over each other was a reasonable distance, yet under such circumstances a question of fact was raised whether extra precautions ought to have been taken to have avoided injury. "Would guard wires have tended to prevent contact, and should they have been added by the electric light company in this case? Could their wires have been so insulated, at the place of this crossing, as to have prevented a diversion of the current in case the telephone wire for any cause sagged or fell? And, if so, was there such a reason to apprehend a possible sag or fall that a prudent man using such a powerful and deadly current would have insulated the wires" The jury found that other precautions should have been taken, and the appellate court approving the law suggested by the above questions affirmed the judgment against the telephone and electric light companies.

Horning v. Hudson River Telephone Company, 97 N. Y. Supp. 625.

VALIDITY OF LICENSE FEES ON POLES AND WIRES IN TENNESSEE LAW DECLARED BY FEDERAL COURT.

The city of Memphis in 1902 passed an ordinance requiring the Postal Telegraph Company to pay into the city treasury three dollars per annum for each pole it had in the different streets. In 1879 the Legislature of the state passed a law conferring the entire control of the streets of the city on the municipality. In 1885 the Legislature passed a general law providing that telegraph and telephone companies "may construct, operate and maintain such telegraph, telephone or other lines for the transmission of intelligence, along and over the public highways and streets of the cities and towns of this state, or across and under the waters and over any lands or public works belonging to this state." The above company refused to pay this rental fee, claiming that the general law of 1885 gave it authority to use the streets of Memphis without being assessed for the privilege. It can readily be seen that the determining question was whether the general law granting to telephone and telegraph companies the right to use the streets and highways took away from municipalities control over them, or whether the earlier law was in operation and the latter law was meant to extend to such companies the right to use the streets subject to local regulations. The Federal court that decided the case held that both laws were operative and that the city properly passed the ordinance and that it was binding upon the company. It was said in part, "that the power to charge a telegraph company with a portion of the cost of making and keeping in repair and policing a street of the city is lodged somewhere. * * * The share for the cost of maintenance for public use belonged to the city. The share due from the telegraph company for its special use was due to the city, for the latter was carrying it, and its treasury should be reimbursed. It was a local matter and could be most conveniently attended to by the officials of the municipality. * * * It was therefore perfectly reasonable that the city should possess the authority to make and collect such a charge. * * * There seems to us strong reason for believing that the Legislature had no intention of reserving to the state the power to charge the telegraph company for its proportion of the cost of maintaining the streets, * * * that it was intended to leave the matter with the authorities to which it granted the power of control." The matter of validity of license fees has been before the different courts at various times and their collection generally objected to on the ground that such action is double taxation, but it seems this is the first instance where the test has been made along the lines in this case.

City of Memphis v. Postal Telegraph Company, 145 Federal 602.

The low grade freight line of the Pennsylvania railroad from Harrisburg to Atglen was completed recently and found satisfactory by a party of officers who were on the first train to be run over it. The line will be divided into eleven sections and operated by telephone, it being the first long section of steam road in this country to be thus controlled.

ADVERTISING MACHINERY AND SUPPLIES

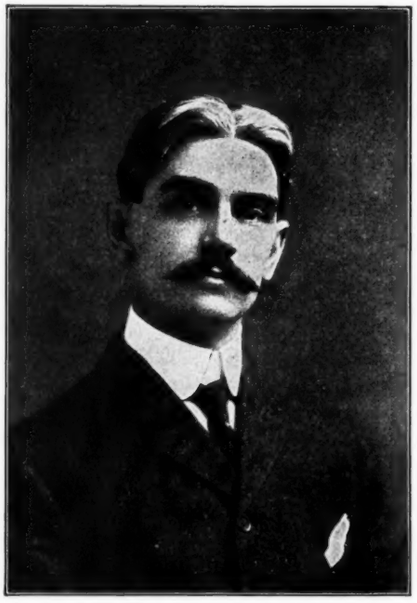
An Article that Should Appeal to Manufacturers in the Telephone and Kindred Fields

By W. Hull Western

IT is authoritatively stated that $300,000,000 was spent last year in this country alone for advertising of various kinds. The figures prove what an important factor advertising has become in the successful conduct of business generally, and how great a part it plays in the fortunes of every one who has anything to sell. This includes the manufacturers of machinery, the dealer in mechanical appliances and the like. I particularize purposely.

Granted there are exceptions, the average user of space in the trade and technical journals does not take the matter of advertising very seriously. The situation is working toward a truer understanding, as it naturally must, but in general the subject arouses little genuine enthusiasm. Usually it is dodged, side-tracked, or avoided as often and as quickly as possible. It is not rare to find it openly damned.

In one establishment I know of the mere mention of the word "advertising" within the hearing of the "Old Man" is sufficient to raise the temperature several degrees, and woe to the culprit who utters it. Another concern had for a long time on its office door a sign which read, "No Beggars, Peddlers or Advertising Canvassers Allowed." It really did not make much difference, of course (to the advertising men), and the sign came down eventually, but that is a story in itself. Considering the great interest that is taken in advertising by the so-called "general advertiser," and the eagerness of his class to keep in step with the best advertising practice, the "don't care" way in which the matter is usually regarded by the advertisers in the trade journals is unique, and furnishes food for thought. To give fair credit there is a belief more or less guardedly expressed that it is the proper thing to advertise—that one should spend something in this way to keep before the trade. Nothing really definite, however, is planned or expected, and the contracts are largely made on the basis of chance.



W. Hull Western, Manufacturers' Advertising Bureau.

What a way to mistreat the elusive dollars! It is not difficult to understand why "the advertising" thus becomes a downright nuisance in most establishments, and the money that is spent in doing it reckoned, oftener than not, as good as wasted. What is to be got out of advertising depends upon what is put into it, not in the money alone, but in attention, brains, energy. This in turn depends upon the enthusiasm and interest the work engenders. To quote a former statement, "money seems to be almost the only thing put into advertising by the average trade journal advertiser to-day, and this is *just put in.*" In seeking the "why" of the matter, it must be admitted off-hand that twin motor-dynamos and similar devices are not household necessities, to be sold by the gross or case. Neither do they offer a particularly attractive proposition as the basis of a mail order business. The trade from advertising products of a mechanical nature generally comes in a more round-about way; its cultivation calls for time and the exercise of much faith and patience. It is obvious the conditions are not such as to make for an exuberance of enthusiasm.

How rare, too, it is to find anyone in a manufacturing concern (among those fitted for the work) who is inclined to take the advertising in hand. Such individuals usually have enough responsibilities to shoulder without seeking what is tacitly understood to be "a thankless job" in addition, and so it is this very important work is passed from one to another, until it has gone the rounds of the office staff, to become at last the most neglected and tattered department of the business. Every business is more or less "peculiar" to itself, and the advertising that is to be profitable must be adapted to meet the different conditions which obtain in each individual case. It is evident, therefore, that no hard and fast rules can be promulgated that will insure unvarying results. As it is successful advertising is no child's play.

It is a matter of study and experiment, and "try, try again." If trade journal advertisers generally could be brought to appreciate what a big and vital matter advertising really is, I believe they would give this important aid to the selling department the thoughtful and systematic attention it deserves.

The time has long passed since the question, "Does advertising pay?" has been asked seriously. Many theories have been cast aside, reluctantly at times, by those who have studied the business of advertising year after year, and much in the way of facts has been proved.

Scientific advertising has nearly arrived. Possibilities have been uncovered which to-day can not be overlooked by the modern man in trade who would not only forge ahead but hold his own. The mission of advertising is dual—to create new business and aid in keeping that already secured. If it is of the right kind it will do this, and though of a poor sort some good will result.

Nothing else can bring one's product as economically and directly to the notice of the trade or the consumer. For a sluggish business liver a liberal dose of printer's ink, properly prescribed and administered, is a veritable blue pill.

By the aid of advertising it is possible for the merchant and manufacturer to reach and cultivate out-of-the-way markets where the man on the road could not seek trade with any substantial degree of profit. It will, moreover, blaze the way effectively for these pioneers of business, working back and forth throughout civilization, making the price-list, catalogue, and other trade literature which follows welcome and of greater interest.

Beyond all this, a live, liberal line of advertising is proof positive that the concern back of it is wide-awake and "doing things" in a broad-gauge, trade-deserving way. There is

still a good deal in appearances, and one cannot help but feel that such people are those with whom we want to do business. Trade naturally drifts in their direction. Too often underestimated, it seems to me, is the "life" and "ginger" that an aggressive advertising campaign puts into a business as a whole, urging everyone from the office boy to the "Board" to renewed and greater effort, and in a way that tells mightily for profit in the ultimate accounting. Then again, a forcible and persistent line of advertising begets confidence, and this is the basis for all trade relations. There is also the opportunity afforded through advertising of securing representatives in distant cities and foreign countries, for it often occurs that firms and individuals of standing seek the agency in their particular territory for goods that are widely advertised, knowing that such articles are easier to sell than those of less reputation, and, therefore, more profitable to handle.

The various indexes, usually a prominent feature of the trade and technical publications, are often utilized as purchasing guides, and a concern that advertises and is properly listed in them is always on the ground and in line for business. Many other benefits develop with time and differing individual conditions. Some things may profitably be borne in mind if one is to go about the matter of advertising properly. It can not safely be left to take care of itself, nor its management entrusted to a junior clerk without experience, but who believes "any one can tackle the job" and make good. No man can give the advertising end of a business the attention it deserves and try to crowd other work in with it. The proposition is too big and serious a one to be handled in this way with anything like satisfactory results. Most manufacturers already know that it does not pay to advertise simply because Jones does, for the fun of seeing one's name in bold face type, or because, the solicitor keeps coming and "Won't take 'No' for an answer." But all do not act accordingly.

There should be a clear cut business reason for every contract that is made. Sentiment really doesn't count, if you're working for results. Underlying all must be a keen appreciation of the fact that the advertising deserves and should be given the same care and financial support as is given other departments of a business if the results are to be as satisfactory.

Naturally the advertising comes within the jurisdiction of the sales department, and should be managed in accord with the head of that part of the business, the selling force and branch offices. The trade and technical journals as a class are improving steadily. When one considers the great and continued expenditures in every direction that are made by the leading publishers of to-day, so that their mediums may prove constantly more worthy and thus more profitable to the advertiser, it is apparent they should command and receive the hearty appreciation and support of the trade generally.

Few get the encouragement they should in this direction.

Every profession, trade and industry has its publications that are worth while—publications that are read, believed in, and made use of in a commercial way and that can be depended upon to return value received and more if advertisers will use them properly. It almost goes without saying that in order to get the best results the goods advertised must have merit and be offered at a fair price. Given this, nothing can withstand the insistent power of printer's ink for any considerable length of time.

One should also bring to the work constant and undivided attention, tact, a judgment that is sound, and the capacity for investigation and comparison of values in mediums offered that comes only to a mind trained by long and wide experience. The qualifications are not common.

When, however, they are not within one's own business household, it is possible to secure them elsewhere.

A SUCCESSFUL MANAGER.

W. W. Libhart, who is entering his second year as manager of the Local Telephone Company, of Norwalk, O., has achieved much success since he took charge of that exchange. When he assumed the management the Independent company had fewer than 600 telephones, while the Bell rival concern operated more than 900 in Norwalk. By close attention to business and determined effort, Manager Libhart increased the installation of his company to 970, and the Independent concern is still growing. Norwalk is the county seat of Huron county, and has a population of 10,000.

The Local Telephone Company has the common battery equipment, four-party harmonic, installed on each key shelf. The rural lines are eight-party harmonic and the service is

W. W. Libhart.

giving satisfaction to its patrons. The company has a storage battery plant, power panels and charging panels, one alternating 110-volt charging set, one direct current charging set, a 110-volt direct current harmonic ringing machine, and a motor cycle ringing set, the operation coming exclusively from the storage batteries.

Mr. J. S. Phillips is the wire chief in charge of the operating force, which is well disciplined and renders efficient service.

Telephone service has been established on all freight trains of the Galveston, Harrisburg & San Antonio railroad between San Antonio and El Paso, and it is now possible for a train crew at any place along the line to get connection with the train dispatchers along the division. The service is of greatest value when a freight crew is caught out on a blind siding. One of the crew can get connection by the telegraph wire and receive his instructions from the dispatcher. In case of a wreck he can immediately telephone for assistance or instructions. Each caboose is equipped with a telephone instrument. With an extension fishing pole-like arrangement, the conductor can make connections with the railroad telegraph wire and reach the office he desires.

A SPECIAL WORD TO SUBSCRIBERS

In requesting change of address, always give the name of the post office to which your magazine is sent. Your name cannot be found on our books unless this is done.

TELEPHONY is not returnable from the newsdealer. If you desire to purchase the paper from a dealer it will be to your advantage to notify him that you will want it, in order to insure his having a copy for you. If you wish to receive the paper regularly, please send in your subscription so that we can mail it to you direct.

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EDITORIAL DEPARTMENT

DON'T NIBBLE THE KELLOGG HOOK.

AT the risk of being accused of harping on one string too long, TELEPHONY feels constrained again to warn Independent telephone men not to patronize the Bell-controlled Kellogg Switchboard & Supply Company. But after all, it is a text on which too many sermons can hardly be preached. The situation is as perilous as ever. The Kellogg company is still seeking the patronage of Independents, and every dollar the latter pay that concern finds its way into the coffers of the Bell combine, to be utilized in carrying on a relentless warfare designed to cripple the Independent movement wherever possible. For that simple reason no Independent should purchase equipment or supplies from the Bell-Kellogg concern, which is masquerading in sheep's clothing. Beware of arming the enemy who has designs on your existence and is scheming to hoodwink you and place you at a disadvantage.

Most Independent telephone men are awake to the danger of the situation, but the Kellogg people are striving to gain a foothold in Independent exchanges more persistently and vigorously than ever before. Eternal vigilance is the price of safety in the fight with the Bell octopus, and the brethren of the shield can not afford to relax their guard even for a moment. The safest way to do is to have no dealings with the Bell-owned concern, and then there can be no cause for regret.

The Independent manufacturers deserve the patronage and support of the operators in the Independent telephone field. They are fighting the good fight, and supporting the forces arrayed against the telephone monopoly. Therefore they are entitled to the undivided, loyal backing of all Independents. When one can help a friend and rebuke an implacable enemy at the same time there should be no choice. Common gratitude and common sense alike point like a sign post to the path to be traveled. To ignore the direction would be nothing less than folly.

All Independents should let the Kellogg concern severely alone.

THE LATZKE BOOK STILL SOARS.

IT is with a natural pride that TELEPHONY reports to the Independent field that the demand for Mr. Latzke's book, "A Fight With an Octopus," exceeds all expectations, and proves conclusively the wisdom of circulating this effective expose of Bell tactics in a permanent form. Already it has been necessary to print three editions, and orders are pouring in at a rate that shows the opponents of the Bell combine appreciate the value and possibilities of the book. From every quarter come enthusiastic recommendations of the stroke of enterprise which brings the facts of the great telephone contest straight home to the people. The president of the International Independent Telephone Association has voluntarily embraced every opportunity to urge operators and manufacturers to assist in the circulation of this frank and fearless history of the battle with the trust, and at both the Toronto and Cleveland conventions he indorsed "A Fight With an Octopus" most heartily. There is a strong interest taken in the book across the border, and our Canadian friends have welcomed it as a valuable ally in their crusade against the Bell in the Dominion. In this country many state associations have shown a deep appreciation of the Latzke book and have left no stone unturned to widen its circulation. In short, "A Fight With an Octopus" seems to have reached the right spot, and to be accomplishing what TELEPHONY desired—that is, to furnish Independent telephone men effective means to fight the Bell on more even terms by telling the public the plain, cold facts in the case.

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IOWA STILL LEADS.

THE report of the executive council of the state of Iowa, dated July 21, 1906, which is just off the press, gives some interesting figures concerning the telephone development in Iowa. It is hardly conceivable that Iowa has nearly 200,000 Independent telephones against less than 40,000 for the Bell interests. When Bell statisticians try to prove the Independent telephone movement is a myth, it is only necessary to point to the following figures, taken from the report of the executive council:

Bell Company and Allied Companies Not Independent.

	Exchange & Rural Instruments	Instruments on Toll Lines.	
Iowa Telephone Company.	33,489	873	
Nebraska Telephone Co. ...	3,044	16	
Western Electric Co.	1,254	170	38,836
Total	37,777	1,059	
Independent Telephone Companies	183,586	903	
Total			184,489
	221,363		
	1,962		
Grand Total	223,325		223,325

According to the latest United States revenue report, Bulletin No. 17, page 25, "Iowa is shown to have reported more rural telephones than any other state, and 21.9 per cent of all such telephones in the United States."

The increase over last year's report shown by the executive council indicates that Iowa still leads the world in the number of Independent rural telephones, and from reports from the other states received it appears that the Independents lead the Bell in the number of telephone instruments installed by over a million.

TRADE JOURNALS AS SELF-HELPS.

THE hearing before the congressional postal commission regarding the relation of second class mail matter to the deficit in the postoffice department brought to light many important points on this much-discussed and much-disputed point. In ill-informed quarters the conclusion has been too hastily formed that the national government could save money by increasing the rate of second class matter, and compelling publications to pay more than one cent a pound for transmission by mail. Arguments submitted to the postal commission proved that there are two sides to the case. It was shown that in all probability second class matter would not be carried at a loss if the railroads having contracts to haul the mails were not paid more than they should be. That is to say, if the government exercised the same care that a private corporation shows in making a contract with a railroad, the postoffice department could well afford to carry second class matter at the existing rates. Another point emphasized—and a most important one—was that the dissemination of magazines, trade papers, and other periodicals constituting second class matter increases the volume of the first class matter, on which the postoffice department realizes a profit. In other words, that the federal outlay in distributing second class mail represents a fruitful investment which yields certain returns by swelling the total of the profitable business transacted by the postal branch of the government. Still another strong point made in favor of the present rate was that second class matter has a far-reaching influence in the education of the people, and that even though it might entail financial loss to the government in dollars and cents—which it plainly does not—it is still a wise policy for the department to encourage the growth of second class matter because of its undoubted tendency to add to the general knowledge of the people at large.

Trade journals have become such an intimate factor in the material welfare of the United States that many are prone to overlook the part they play in the commercial development of the country. Yet every up-to-date manufacturer and business man will testify to the assistance rendered by trade publications in the up-building of American industries. The trade and technical journals have been called the live text-books of colleges, for the ordinary printed books dealing with progressive science and art are several years behind the latest discoveries, while the trade papers are literally up to date. The trade journal fills a field which even the daily newspaper can not possibly supply. Our great metropolitan dailies are supposed to cover all subjects of passing interest, but of necessity they can not be expected to furnish their readers that specialized knowledge which each trade publication supplies in its own particular field. It follows that, compared to the daily, the trade paper has a more limited horizon, but within its scope it is imperative that it be accurate, complete and absolutely reliable. Otherwise its usefulness, of course, is nil, and its contents not only valueless but positively dangerous. In other words, the trade journal must be sound, safe and sane—that is, accurate and reliable.

Technical and trade journals are as much the business tools of the manufacturer and artisan as is any machine in the works. They do not read their trade papers for amusement, but to keep abreast of affairs in their lines of work. They expect to find in its pages *mental meat* which will broaden their views, increase their opportunities and help them to take advantage of those opportunities. In short, they expect the trade journal to help them up the ladder of success.

As a vital part of our commercial system the trade journals deserve the support and encouragement of the people and of the government which represents the people. Generally speaking it is the smaller business man and struggling, ambitious mechanic who need the trade paper most, and the logical argument was made at the postal hearing that these classes would suffer most from any plan to handicap or impede the circulation of such publications. Any move in this direction is a blow at national progress and industrial prosperity. Not only that, but by circumscribing educational advantages, it would tend to retard the growth and development of the American citizen

The greatest figure in the world's history once said, "The Sabbath was made for man; not man for the Sabbath." In this day it might be said, "The postoffice exists for the people; not the people for the postoffice." As the people receive material benefits from the trade and technical journals it is contended by men of patriotism as well as of business acumen that it would be a short-sighted policy to do anything which would restrict their circulation and keep them from those who use them to advantage. The greatest good for the greatest number is a motto which has special application in this instance.

THE CHEERFUL VOICE.

TELEPHONE operators can have no better asset than a cheerful, pleasant voice. Its value, perhaps, is intangible, and cannot be estimated in dollars and cents, but there is no gainsaying the fact that a clear, pleasant voice in an operator aids immeasurably in making a telephone conversation interesting and pleasant instead of burdensome and annoying. No matter how gruff and harsh the man who has had difficulty in getting his number may be the courteous, cheery voice of the experienced operator usually soothes his ruffled feelings, and, nine times out of ten, he will soften his angry bass and, apologizing—mentally, at least—and proceed in a much gentler mood.

A foreign telephone journal recently asked the question: "Do subscribers appreciate a cheerful voice?" and the answers received removed all doubt, for the response was

general and invariably in the affirmative. A languid, feeble voice does not meet the requirements no matter how sweet its cadences, for it inspires the feeling that the operator is indifferent—"not up to the mark," in fact, and liable to make mistakes and be slow in attending to the subscriber's wants. Likewise, there are objections to the sharp voice, with the jerky utterance, which proves quite as irritating as the feeble or low-pitched voice.

The cheerful, distinct voice which carries good temper and confidence over the line is the ideal vocal equipment for the operator who wishes to make a success of his calling or her calling. All are not endowed by nature with this kind of a voice, but much can be done by careful cultivation. Everybody can speak cheerfully at least, and that will "help some".

As we all know, subscribers are prone to become impatient at delays and mistakes, which will happen in the best-regulated exchanges, and express their irritability by snapping at "Central". If the operator answers in the same spirit, of course there is discord and the angry influence of both subscriber and operator is bound to radiate to others with whom they come in contact while their huffiness continues. But, supposing the operator quietly and pleasantly explains the situation and manifests a cheerful, courteous disposition to overlook the gruffness of the subscriber? The latter is certain to regret his thoughtlessness and respond in kind.

That is what the cheerful voice will do. It is the lubricant which will keep the exchange working smoothly. Needless to say, there are many times a day when "Central" will find it exceedingly difficult to manifest a cheerfulness which she will not feel, but after all it will make her own work easier in the long run. That the subscriber appreciates the cheerful voice, everyone of us who has used a telephone is willing to testify.

THE INDISPENSABLE TELEPHONE.

ONE might writes volumes on the marvellous extension of telephone service in the United States, showing how far it has outstripped the telegraph in the number of messages sent and in earning capacity as well as in general usefulness. The wonder is not yet so old that people have stopped saying: "How did we ever get on without it?" or "What should we do without it?" But the expansion of the telephone—the broadening of its field of usefulness—is quite as wonderful as its extension into every part of the country.

From the lowest drift of the deepest mines men talk to others on the surface, and a priest has said that it would be possible to receive confession and give absolution to miners cut off from escape by one of the accidents that so often happen. In the big forest reservations the camps of the owners and the cabins of the game keepers or watchmen in different parts of the preserve are connected by wire, and warnings are given, supplies ordered and other business transacted by telephone.

The utilization of this instrument in the Japanese army during the recent war with Russia greatly altered if it did not revolutionize the management and direction of armies in the field and in action. It was related that Marshal Oyama did not see the battle of Mukden, but directed it by telephone instead of by the old methods of aides and couriers. An account of the operations said that the generals were from ten to fifteen miles behind their troops at the front, but that all over the country ran telephone wires, stretched on slender bamboo poles, which the signals corps put up almost as fast as the men could walk. The commanding general could talk with any regiment instantly, and it was declared that "the telephone has come to stay in warfare."

To business, of course, it has become indispensable. One department store has 2,000 telephones in use, and 70,000 messages a day are received. Grocers, butchers and even druggists get a large share of their orders by telephone. Weddings have been performed by wire and affidavits taken upon identification of the voices. Burglars are trapped and fires reported in the same quiet and noiseless manner. In many farming districts the news in the morning and evening papers is bulletined to telephone subscribers at a stated hour. Farmers take advantage of the instrument to get market quotations and know when to take in their products to the buyers. The present limit of long distant telephoning is said to have been reached in a line between Boston and Omaha, over which conversations involving large transactions are held daily. The most novel use of the telephone up to date is reported in the New York Sun—piano tuning at long range. "A woman would let only one tuner touch her piano. It had to be tuned at a certain hour, and it was impossible for him to be there. It was arranged that he should listen to the tuning of the piano by his assistant through the telephone and should tell the assistant exactly when he had tightened or loosened the wires sufficiently. The plan worked satisfactory." Informal dinner invitations, social chats, coughing into the transmitter so that the doctor can diagnose the "cold," notification of the impossibility of keeping an appointment. and a hundred other uses combine to make the term "indispensable" none too strong for the telephone.

EXPANSION.

THE Tuscarawas County Telephone Company, of New Philadelphia, Ohio, has been meeting with excellent success in a plan recently adopted to increase the number of subscribers to its system. The plan is explained in a circular sent out by the company, which is here reproduced for the information of exchange managers:

It is the purpose of the management of the telephone company to extend the use of the telephone in New Philadelphia to every person whose income will permit him to ride on a street car.

We are offering the following prizes, from this date up to December 31, to any person that will secure the largest number of contracts, or will give us the information that will lead us to secure a contract for a telephone within the corporation limits of New Philadelphia. You do not need to secure the contract yourself, but if you hear of any one talking about putting in a telephone, and if you will furnish us with his name and address, we will send a solicitor, and if we secure the contract and install the telephone, we will give you credit for it just the same.

Your chances are equal to secure the prizes. Begin now. If you have not already a telephone, install one in your house, which will add one to your list. Speak to your neighbors about installing a telephone. Show them our directory. Point out to them the advantages of having a telephone in their house—the protection it affords them, and the convenience. A telephone is not a luxury—it is a necessity. Get busy and win the prize.

The first prize is a fifty-dollar bedroom suite; second prize, a telephone in your residence, free for one year.

VALUE OF JUDICIOUS ADVERTISING.

THERE is a vast amount of common sense in the sentiments expressed by Mr. W. Hull Western in his article, "Advertising Machinery and Supplies," which appears on another page of this issue of TELEPHONY. Mr. Western is an advertising expert, trained especially along the line which he has made the topic of his timely and instructive message to manufacturers. As he well says, "the time has passed since the question 'Does advertising pay?' has been asked seriously." Every successful man in business to-day knows that judicious advertising does pay, and, in fact, is essential to the complete success of a company manufacturing things to sell.

The question is not "Shall I advertise?" but "How shall I advertise to insure the best results?" Mr. Western gives some valuable hints along this line, and his remarks should furnish food for reflection to the manufacturer who has not given the subject the careful attention it deserves. The writer is pleased to say that trade and technical journals are

steadily improving. This being true, it follows naturally that their value as advertising mediums is increasing. It therefore behooves the manufacturers of machinery and supplies, and all others, to devote more attention to the question of wise judicious advertising to the end that their expenditures in this direction are properly directed and yield the returns in increased and new business which should result.

TEN SOLICITING HINTS AND A MOTTO.

MR. E. A. REYNOLDS, contract agent for the Johnstown (Pa.) Telephone Company, has sent TELEPHONY the following ten soliciting helps and a motto, which are so good that we should like to have every telephone man read them carefully and profit by their reading. Salesmanship is getting to be more of a science each year, and the man who is modern in his methods is invariably the more successful. Mr. Reynolds' ten soliciting helps and a motto follow:

Give your prospective subscriber your business card in all cases where you can do so easily. It helps to introduce you, represents your entire company, and places in his hand part of your proposition while you are presenting it.

Appeal to your listener's intelligence. If he hasn't any, he'll be flattered believing you have discovered it; if he has, he'll be pleased at your estimate of him. Be careful of the "hot air," however.

A prospective customer's first impression of you is generally a strong one; if you are to be successful this impression should never fall short of the one hundred per cent mark. The ninety-nine per cent mark is against you.

Be careful of the word "competitor." The average man whom you talk telephone service to believes he doesn't have any. "Others in your same line," is better than "your competitors."

Good clothes, personal cleanliness, simple, quiet dignity, courtesy, and self-respect count enormously toward winning success—and getting contracts.

Have your contracts partly filled out. Too much writing in the presence of your prospective subscriber may cause him to change his mind.

Remember that you are only one of your company. Others follow after you. Don't misrepresent anything.

Refer to contracts as "applications." The average man shuns a contract unless he draws it himself.

After quoting the yearly rental, keep close to the quarterly, monthly or daily cost.

Make mental notes of your surroundings. Get close to your prospective customer's interests.

Ability and genius may fail, but perseverance never does.

NEWS SERVICE BY TELEPHONE.

IN MANY parts of the rural field a telephone news service has been inaugurated which is proving both popular and practical. Twice a day, at noon and seven o'clock in the evening, a call is given and all the subscribers on the line are given an outline of the important news of the day from the central exchange, usually located in a town having a telegraph office. The plan has been tried in Minnesota, Iowa and the Dakotas, and found to be a success, as country subscribers commend it highly. The idea originated with a newspaper editor who at first supplied the farmers and cross-roads merchants with the market quotations. Then he elaborated the service and furnished a digest of the most vital news of the day. In this way the rural subscriber is able to learn of important events even before the city dweller.

Instead of injuring the circulation of newspapers, as might be supposed, the telephone news service has increased the demand for them, as the wire reports seem to arouse the interest of people in what is happening in the world, and this whetted curiosity has led them to seek for more complete details. Nevertheless, it is the telephone which gives the residents outside of cities and towns their first intimation of current events. When Gov. Guild of Massachusetts issued his letter calling on the people of the state to contribute to the relief of the California sufferers he had the appeal telephoned to every town and village, and within a few hours the proclamation was posted in all the 356 municipalities in the state.

ADVERTISING THAT PAYS.

IN NO business does judicious advertising bring such large and certain returns as to the various lines of trade connected with the telephone industry. The telephone, comparatively speaking, is so new an invention that its possibilities are little known. The enterprise of telephone manufacturers and those engaged in the making of telephone supplies is constantly producing new and better appliances, and it is a safe assertion that the exchange manager doesn't wait long after getting his new TELEPHONY before scanning the advertising pages to see what the trade offers him for the improving of the service, reducing ultimate expenses and modernizing his plant.

To a certain extent this is true of advertising all technical lines, but, we repeat it, it especially applies to the telephone world. Without flattery—for it is the simple truth—Independent telephone men are more than ordinarily progressive and up-to-date. They are always on the lookout for the latest thing in telephone invention. This is proved by the industry they display in examining the trade exhibits at conventions. They are ever on the alert to learn of the new developments in telephone evolution.

The wise manufacturer, knowing this, acts accordingly, and keeps his products always before the inquiring operator. The result is that when the salesman representing that manufacturer visits that operator the work is half done. Of course, advertising can not make terms and secure a signature to a contract, but it paves the way effectively and the solicitor "does the rest". The valuable time often thus saved the salesman is incalculable.

A mistake often made by telephone advertisers is in spasmodic, irregular advertising. They take a "flyer" so to speak, and then after cutting a dash for a brief time discontinue their efforts. A similar policy in the handling of salesmen would produce no results, as every business man knows. The salesman does not always get an order the first time he visits a prospective customer, nor on the second and often not on the tenth. Usually, however, the constant, aggressive, intelligent follow-up method wins. Apply the same principle to advertising. Given a meritorious article, the work of a long-continued, regular, systematic advertising campaign will bring it to the attention of the trade for which it is designed, and the demand for it is sure to justify the theory that telephone advertising pays.

The man on the road knows the value of sensible advertising. Many a time has he entered the office of an exchange manager and begun to talk of his goods only to be interrupted by the customer remarking, "Oh, yes, I noticed your ad in the October TELEPHONY." This is welcome news to the salesman, and it is also a matter of pride to the customer that he is able to let the visitor know that he keeps posted on matters touching his business.

To the shrewd reader the advertising pages of the technical trade journal are as interesting and useful as the others. From the advertising section he obtains valuable information as to what the trade has to offer. TELEPHONY has had this fact brought home to it many, many times. In fact the editor would feel a natural pride if he were assured that the editorial contents were studied with as much interest and attention as are TELEPHONY'S *advertising* columns.

INEFFECTIVE CALLS

Abstract of a Paper read before the Manchester, England, Telephone Society.

By W. Napier

"IT should always be borne in mind that a subscriber does not know what is taking place at the operator's end of the line, and through a want of knowledge rather than from an intention to say that which is not true, he is frequently led into making statements that are not always in accordance with the facts of the case." This statement will be found on the first pages of all books of operating regulations issued by the general manager.

A short time ago a certain subscriber called for his own number. The operator in the usual way tested the number on the multiple and replied "Number engaged." The subscriber stated that it was his own number he had called for, and this just proved that the operators were a pack of liars, that his number could not be engaged. The explanation is that operators do not of course examine the numbers on the answering jacks, and are frequently not aware of the caller's number. It was explained to the subscriber that his calling and being answered by the operator at once engaged his line, but he said that operators were liars, and he appeared to think it a serious matter.

The operator in the case in point replied correctly and according to the routine laid down by the company, though it is easy to see that such an incident would create a totally wrong impression to anyone unfamiliar with the multiple board.

Quite recently one of the company's officers made a similar report to me, minus the bad language. He had called for the number of the instrument he was speaking from and could not see why the operator should reply "Number engaged."

Two essential points in the production of good telephone service are:

Absence of the reply "Number engaged." and absence of the reply "Don't answer." The expression used should not be *"Won't* answer," as this implies to a certain extent that the party called can but *will not* reply.

It is obvious that an entire absence of ineffective calls is impossible, but it is equally obvious that there must exist means whereby the proportion of such calls can be reduced.

It is clear from Figure 1 that the ineffective calls, that is, calls in which operators answer, take the number required and do more or less further work, but can not complete the connection or can not obtain a reply, represent a very large fraction of the total work done. In fact no less than 22.3 per cent.

What applies to Manchester in this respect applies to a large extent to other towns throughout the country, varying no doubt according to the traffic and the system of working.

In the diagram I have plotted two lines, *A* and *B*, *A* being total calls, effective and ineffective, *B* being effective calls only.

The shaded portion, therefore, represents the waste. *C* probably shows the proportion more clearly. Allow that the work in dealing with an ineffective call is equal to .75 of that on an effective call, it is clear that in an exchange where the wages run to £100 per week the loss to the company through operators having to deal with ineffective calls must be .75 of £22 6s. 8d. or £16 8s. per week. Therefore, if the ineffective work can be wiped out a corresponding amount of effective or productive work will be done instead. In addition to the operator's time, there must, of course, also be taken into consideration the wear and tear on cords, keys, signals, jacks, instruments, etc., and the waste of current; and in the background there is the correspondence arising from complaints. By increasing the percentage of ineffective calls, beyond satisfying subscribers, there is a distinct money gain to be made.

The proportion of ineffective calls is admittedly high.

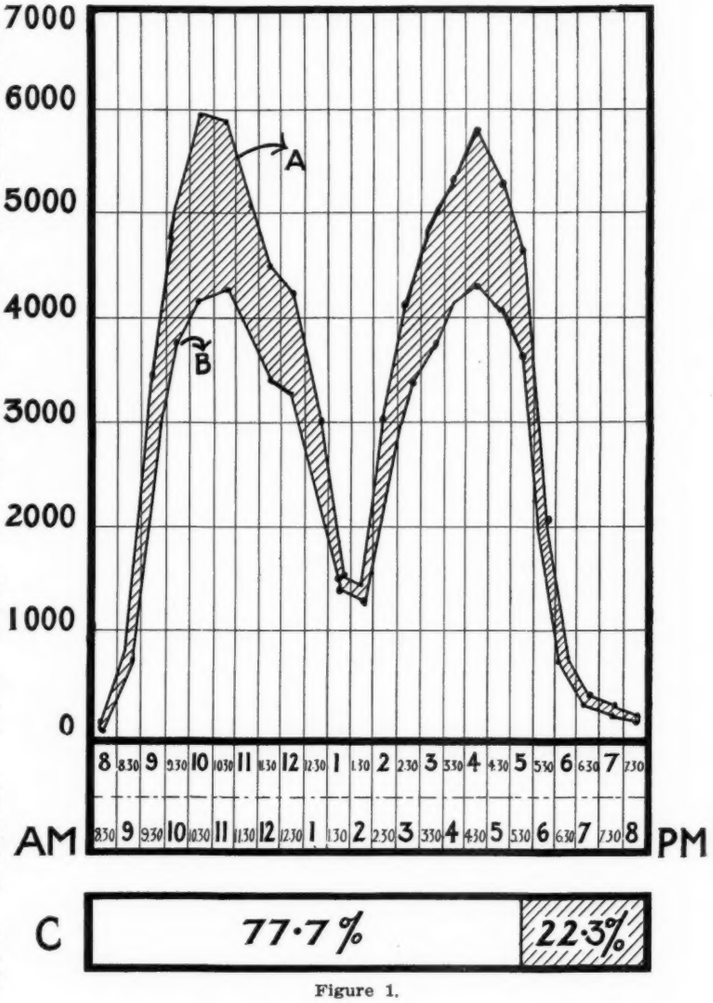


Figure 1.

This results in an uneconomical and an unsatisfactory service.

I contend that much more can be done outside the switchroom than in it to reduce the trouble.

The points for consideration are:

(1) Subscribers should have a sufficient number of lines to carry their traffic effectively.

(2) It is essential that careful attention should be paid to the necessity for giving the clearing signal to exchange on the completion of each call. In all cases both calling and called subscriber should be clear.

(3) If it is found necessary during a conversation that a considerable time must elapse before a reply can be given to terminate the business in hand both subscribers should clear their lines and, when ready, originate a fresh connection. In other words, subscribers should not hold their lines "engaged" needlessly.

(4) Responsible individuals or trained operators should be employed by subscribers to use their telephones. The prevailing method of handing over this important work to

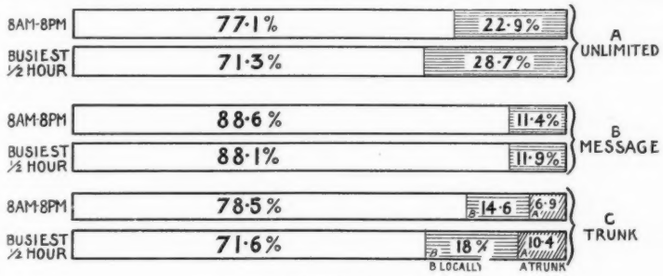


Figure 2.

the junior office boy is out-of-date and altogether inefficient.

(5) Telephone engineers and experts of to-day look to improved systems and thoroughly reliable signals to reduce the ineffective calls. The portion which the operators can control comes far down in the list of remedies.

Referring to Figure 2, it is evident that ineffective calls vary in proportion according to the class of subscriber called and the time of day. The record was taken on March 28, 1905. *A* shows that on an average 22.9 per cent of calls to flat rate lines were ineffective, but in *B* it is shown that with message rate lines only 11.4 per cent are ineffective. *C* shows applications by postoffice for trunk calls. I should here point out that it is much more work in Manchester for an operator to connect to a message rate line than to a flat rate, on account of the fact that connections to message rate numbers all pass through transfer junctions. This point is worth the consideration of those who think that operators gain something by replying "engaged".

The real cause of the difference is, of course, that message rate lines are used by the smaller firms as a rule and are less frequently and more discriminately used. Therefore the chances of getting them when required are much greater.

For a directly opposite result, take a busy flat rate subscriber. In Figure 3 is shown the result of two hours' careful observation made on the two lines of a railway company, designated *A* and *B*.

The diagram is divided off into minutes (120) and the horizontal lines represent the duration of each connection. The continuous lines are inward calls, and the dotted lines outward calls. It is evident that nearly all the connections were inward, being probably inquiries regarding goods and deliveries. The individual dots represent ineffective calls.

It is noticeable that a very large number of the ineffective calls were made within a very short period, 11.45 a. m. to 12:30 p. m. Follow the case of *c*; I am sure he will have your sympathy and deserved the connection he got at 12:49 p. m.; *d* fared better because he called at shorter intervals.

These particulars were taken specially, and carefully observed with a stop watch, on account of a complaint from the said railway company to the district manager, stating that the public had difficulty in getting them.

The diagram was prepared later. It illustrates very fairly what occurs daily on the lines of railway companies and other busy concerns.

The Manchester service inspector on March 15, 1905, called on a subscriber regarding a complaint. In his presence the subscriber booked at one time eight trunk calls. That subscriber now has an auxiliary line.

A special record of ineffective calls was made during a half-hour on a Saturday morning.

The total number of times the reply "engaged" was given during that half-hour was 2,286.

A feature of this record was the unequal distribution of the ineffective calls.

Out of 6,800 lines on Manchester exchange, only 1,008 were concerned, as follows:

For 5,792 subscribers no call made when engaged.
For 535 subscribers 1 call made when engaged.
For 206 subscribers 2 calls made when engaged.
For 111 subscribers 3 calls made when engaged.

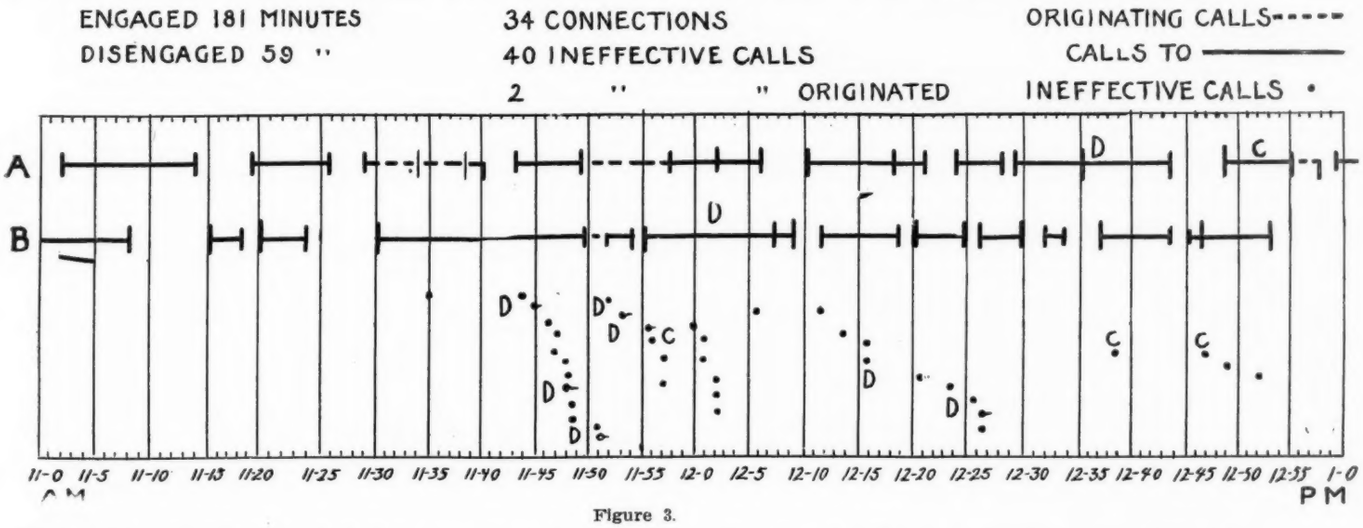

ENGAGED 181 MINUTES
DISENGAGED 59 "
34 CONNECTIONS
40 INEFFECTIVE CALLS
2 " " ORIGINATED
ORIGINATING CALLS-----
CALLS TO ——————
INEFFECTIVE CALLS •
A
B
11-0 11-5 11-10 11-15 11-20 11-25 11-30 11-35 11-40 11-45 11-50 11-55 12-0 12-5 12-10 12-15 12-20 12-25 12-30 12-35 12-40 12-45 12-50 12-55 1-0
A M
P M

Figure 3.

For 57 subscribers 4 calls made when engaged.
For 38 subscribers 5 calls made when engaged.
For 19 subscribers, 6 calls made when engaged.
For 9 subscribers 7 calls made when engaged.
For 6 subscribers 8 calls made when engaged.
For 10 subscribers 9 calls made when engaged.
For 4 subscribers 10 calls made when engaged.
For 2 subscribers 12 calls made when engaged.
For 3 subscribers 13 calls made when engaged.
For 1 subscriber 14 calls made when engaged.
For 1 subscriber 15 calls made when engaged.
For 1 subscriber 19 calls made when engaged.
For 2 subscribers 20 calls made when engaged.
For 2 subscribers 25 calls made when engaged.

For 1 subscriber 32 calls made when engaged.

If we deduct the cases in which one to three calls were made for the same number, we have 1,006 calls for 146 subscribers. Further, we find that 778 applications were concentrated on 99 subscribers; an analysis of the lines in such demand is as follows:

	No. of firms.	No. of ineffective calls.
Railway companies, railway companies' agents, carriers and canals	12	147
Retail merchants and manufacturers	5	67
Engineers	8	75
Wholesale chemists and oil merchants	3	37
Timber importers and merchants	4	35
Wholesale merchants, provisions, fish and poultry, corn, etc.	7	46
Corporation	1	13
Cloth and yarn merchants, agents	9	62
Shippers and packers	8	55
Calico printers and spinners, bleachers, finishers	18	113
Insurance companies	1	6
Brewery companies	1	5
India-rubber manufacturers	3	16
Infirmary	1	7
Abbey Club	1	7
Company's inquiry department	1	6
Printers, stationers and paper manufacturers	3	16
Coal merchants	1	5
Solicitors, surveyors and valuers	5	26
Others	—	11

It is the custom of many subscribers to call up the supervisors when they have been informed several times that a number required is engaged. Operators also refer to their supervisors for assistance in obtaining busy lines. Under such circumstances it is the duty of the supervisor to investigate the matter, and if possible to effect a connection. The following table, representing one day's work of this kind, may be of interest as showing the results of the supervisor's investigations:

TOTAL REQUESTS—		
By subscribers	195	
By operators	151	
		346
Engaged, speaking	157	
Engaged, but not speaking	86	
Cleared before traced	103	
		346
REQUESTS FOR SUB-EXCHANGES—		
Engaged, speaking	19	
Engaged, but not speaking	10	
Cleared before traced	30	
		59

36.6 per cent of numbers traced apparently failed to clear when finished.

There is another class of ineffective calls, due not to the number required being engaged, but to failure on the part of the company's operator and the postoffice trunk operator who is in circuit to obtain a reply within the time allowed.

These features are, of course, due to various faults, errors on part of subscribers in the manipulation of their apparatus, etc. A typical case is as follows:

A letter was received from the postoffice to the effect that trouble was being experienced in connection with calls for 991. On inquiry I found that 991 had lost at least twenty trunk calls between January 1 and March 8. The inspection department reported: "Inspector reports trouble caused by boy who does not put hand set on rest properly. He is small and cannot reach the instrument, which should be lowered." Perhaps we may throw the responsibility in this case on No. 991.

Calls are lost, however, for which the subscriber is not responsible. Correspondence on this subject is always floating, and many cases have a most unsatisfactory ending.

Between January 4 and 24 I recorded particulars of 109 cases in which Manchester subscribers themselves booked calls in the usual manner direct at the postoffice. When these calls matured, which would on an average be within ten minutes, the attention of these subscribers could not be gained, and each had to be abandoned. In such cases the postoffice applies to us for a report on the state of the circuit in question, and these applications pass through the exchange inspection department. The following table shows an analysis of these 109 cases as taken from the inspection reports; the test clerk had in each case tested and reported to the inspection department within a few minutes after the failures:

INEFFECTIVE TRUNK CALLS (ORIGINATED IN MANCHESTER).	
Instrument faults	33
Found O. K.	30
Line faults	20
Faults in testroom	4
Faults in exchange	7
Fitter working	1
Gang working	1
Subscriber admitted absence	2
Subscriber admitted receiver off	1
Subscriber admitted switch in wrong position	5
Receiver off	3
Cradle held up by writing pad	1
New telephone subscriber did not understand	1
	109

I am sure that there is room for some improvement here if we give the matter close attention.

In closing, the following suggestions indicate measures whereby a reduction in ineffective calls may be obtained:

(1) Subscribers with a large traffic should have a corresponding telephone equipment, worked as a private branch exchange, the junctions being connected to consecutive numbers in the multiple.

(2) The necessity for prompt and effective clearing by both parties to a conversation should be impressed on all subscribers.

(3) Subscribers should not encourage keeping a connection up for a long period during which they make enquiries or search for information, but should clear and call again.

(4) The subscriber's telephone or telephones should be attended by a competent person, properly instructed in the correct method of working the service.

(5) Good maintenance and prompt clearing of faults; good construction in the beginning need not be insisted on.

(6) The more general adoption of message rates.

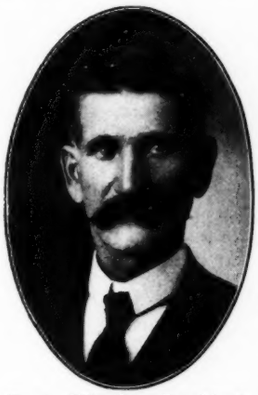
For the purpose of widening the sphere of usefulness of the telephone extensive experiments are being made on the Harriman railroad lines. It is proposed if practicable to equip trains with a telephonic device enabling the conductor and engineer to consult while the train is in motion.

A complete telephone system is also soon to be established in connection with the extensive block signal system now installed and is to be used to bring dispatchers and tower operators into closer touch. It will also serve to connect the dispatcher with the non-telegraphic stations.

On some sections of the roads it is intended to introduce the composite system of wires, by means of which one wire may be used similtaneously for both telephone and telegraph work.

A PROSPEROUS TELEPHONE ASSOCIATION.

The long series of Independent telephone successes is augmented by the record of the Union Mutual Telephone Association of Sioux and Lyon counties, Iowa. This company is an organization of Independent telephone companies for mutual exchange of service and for securing concerted action against any move that may be made by the Bell company.



D. A. Wheeler, President.

The companies forming the Union Association are: The Wheeler and Thomas Telephone Company, Ireton; Ireton Rural Telephone Company, Ireton; Maurice Mutual Telephone Company, Maurice; Sioux Center Telephone Company, Sioux Center; Lester Telephone Company, Lester; Rock Valley Telephone Company, Rock Valley; Doon Telephone Company, Doon; Inwood Telephone Company, Inwood; Lockwood Telephone Company, Lockwood, and the George Telephone Company, George.

The officers of the Union Mutual Telephone Association are: D. A. Wheeler, president, Ireton, Ia.; C. A. Walhof, secretary, Rock Valley, Ia.; Henry De Jong, Jr., treasurer, Maurice, Ia. The Independent movement in these counties dates from about two years ago, and the union of the different branches from last March. At that time all of the towns in the counties which were interested in the Independent telephone movement were invited to meet at Rock Valley to take steps toward throwing off the Bell harness. A good attendance was present at the meeting and an organization was affected. There are now over a thousand telephones in the system and everything is working smoothly. Free service is given between the different exchanges of the system and preparations are now under way for making connection with Sioux City to the system of the New State Telephone Company.

Henry De Jong, Jr., Treas

The Maurice Mutual Telephone Company was one of the first of the companies of the association to break away from the Bell monopoly. About two years ago it started in to organize. Many threats were made against the concern and difficult obstacles were placed in its path, but it was successful from the start. It put in a one-hundred line board and nearly two hundred telephones made by the Swedish American Telephone Company, Chicago, and has added more each month.

C. A. Walhoff, Secretary.

Another of the successful companies is the Sioux Center Telephone Company. Although it has not been in the work more than six months its growth has been remarkable. Its first order was for a one hundred line Swedish American Telephone Company switchboard, and over one hundred telephones made by the same company. The following are some of the men who are most influential and who have worked hard for the success of the association: D. A. Wheeler, Ireton; C. A. Walhoff, Rock Valley; Henry De Jong, Jr., Maurice; N. Wassenaar, Sioux Center; Neal Mouw, P. N. Vos and Anthony F. Parke, Sioux Center; H. M. Mesink, Peter Van Penesem, and John Miras, Maurice. The association is growing rapidly and bids fair to take practically all of the business from its Bell rival.

THE MODEL DETROIT PLANT.

The plant of the Home Telephone Company of Detroit is being built by the Electric Construction Company of St. Louis, Mo. The same interests control the telephone company as well as the construction company. The officers of the Electric Construction Company are Max Koehler of St. Louis, president; Sam B. Jeffries of St. Louis, treasurer; W. B. Woodbury of Detroit, general manager, and W. C. Polk of Birmingham, Ala., chief engineer. Charles H. Ledlie of St. Louis is consulting engineer for the telephone company, and his representative on the ground is Joseph Lillich of St. Louis. The Commonwealth Trust Company of St. Louis is financing the proposition, and its representative on the ground is W. W. Grayson, formerly of the Kinloch Telephone Company.

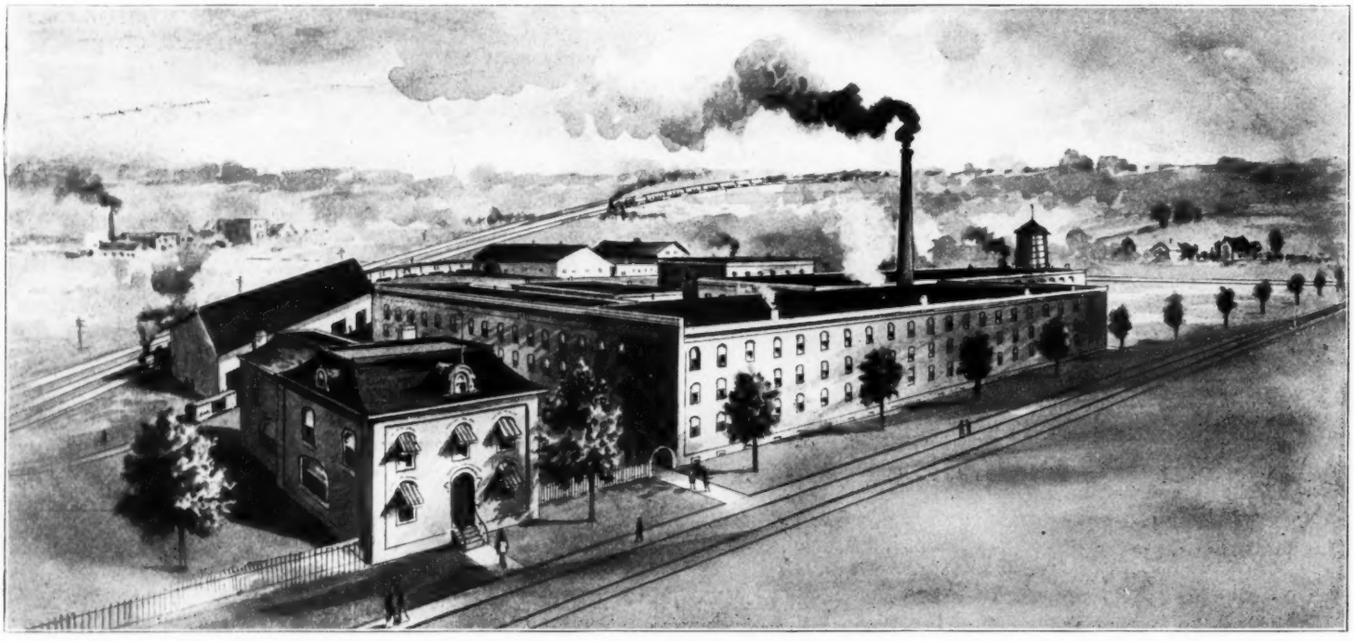
The company has purchased for the site of its central exchange property at the northwest corner of Madison avenue and John R. street, a site 105 feet on Madison avenue and 100 feet on John R. street. The detailed plans and specifications contemplate a building to cover the entire lot, three stories, and devoted entirely to local and long distance telephony. It is expected to have this building ready for occupancy by May 15, 1907. In the illustration the building is shown as it will appear when completed. Telephone experts who have gone over the plans pronounce them the most complete and best adapted for telephone purposes of any plans ever drawn, and calling for the most modern telephone building yet constructed. The first floor, containing 10,000 square feet, is to be devoted to public and executive offices of the company. The accounting and contract departments will open across from each other at the entrance to the building. The offices of general manager and engineer and the board room will be on this floor. The second floor is to be devoted to long distance board, hospital, rest room and lockers for the operators, terminals, battery room and office of the long distance wire chief. The third floor will be for the switchboard exclusively. Under the building there will be a large basement for shops, storage purposes, etc. The exterior will be very attractive in cut stone and fancy brick. Construction work on the system has been actively under way since July 16, and nearly a million feet of the subway is already in the ground and a great many of the terminal poles set in the central exchange district.

Proposed New Building, Home Telephone Company, Detroit.

MANUFACTURERS DEPARTMENT

THE LONG DISTANCE TELEPHONE MANUFACTURING COMPANY.

The Long Distance Telephone Manufacturing Company, formerly located at Jackson boulevard and Canal street, Chicago, Illinois, is now occupying its modern and commodious manufacturing plant at 1108-1116 South High street, South Bend, Indiana. It has taken nearly a year to complete its telephone manufacturing plant, which is now fully equipped with modern and labor saving machinery. This work has been carried on without any great amount of interference with the sales department, shipments being made regularly and orders promptly filled. It is needless to say that this has greatly taxed the capabilities of the management of the company and it is a source of satisfaction to the company and to its customers at large that the new factory is now completed and in perfect running order.



Modern Factory of the Long Distance Telephone Manufacturing Company, South Bend, Indiana.

In view of the exodus of large manufacturing concerns from Chicago into smaller towns, it is almost superfluous to mention the reasons which actuated this company in moving from Chicago, the center of the telephone industry, to South Bend. Over a year ago the company realized that in order to produce its special high grade line of long distance telephone equipment, it would be impossible for the management to sell this line of equipment under the arbitrary conditions of labor and real estate combinations in Chicago without materially increasing the price of the apparatus and thus be unable to meet the ruling market prices on standard equipment. To the laymen it may not appear that any great saving could be made by leaving a large city, but it is almost out of the question for a telephone manufacturing company to own real estate there, and the rents are so excessive, the drayage and cartage so high that there are many valid reasons why manufacturing can be done cheaper in smaller cities.

Further, to keep a product uniform, it is absolutely necessary that the corps of employes throughout the entire plant be satisfied with their positions and retained from year to year. There is a spirit of unrest in the cities, and the different employes drift from one firm to another, thus making it impossible to keep trained mechanics and a rigid system of inspection up to the proper point of efficiency. On the other hand, it is not desirable for a large manufacturing concern to attempt to operate and manufacture in the average small city or village. This was forcibly impressed upon the minds of the management of the company during an investigation on the part of its representatives and a prior experience in attempting to manufacture in small cities. A number of cities adjacent to Chicago made attractive offers to the company for location, but after investigation in each individual case it was found that invariably the towns were too small and freight facilities unsatisfactory. After further investigation it was found that South Bend presented the most attractive location. It was found that the shipping facilities there were unexcelled in any other city in the United States. There are direct connections from South Bend to the west, independent of the Chicago freight yards, and perfect facilities for handling freight on three different roads running north and south. A direct connection has been made from South Bend to the state of New Jersey by a new road. The Wabash has lately been connected with the city, and, in fact, taking everything into consideration, the quick delivery to freight depots in South Bend, the shipment of half-carload and carload lots direct from factory door, entitles South Bend to be considered, for the number of manufacturers located there, superior in freight facilities to any town of its size.

Right here it might be well to say that South Bend has probably the largest number of manufacturers of exclusive lines of any other city in the country. Its watches, sewing machines, plows, wagons, carriages, automobiles, paper boxes, shirts and telephones are shipped to all countries of the globe and it is claimed not in one single instance does the individual line fail to excell that of any other manufacturer.

Where the average telephone manufacturer locates outside of Chicago he experiences great difficulty in obtaining and retaining competent and skilled labor. The many advantages of South Bend are so apparent to the casual in-

Verne Mann, Supt.

Anton Swanson, E. E.

O. E. Johnson, M. E.

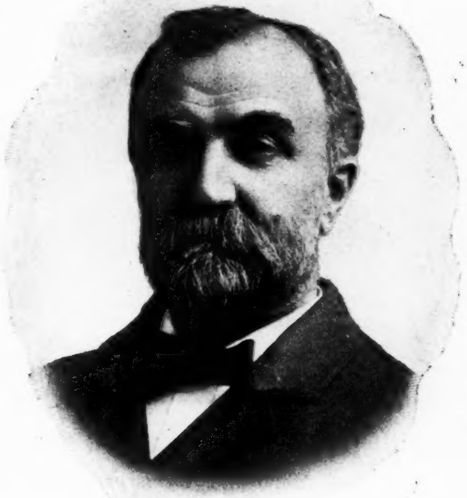
F. L. Heyer, M. E., E. E.

Louis F. Osborne, E. E.

vestigator and the reputation of the city is so well known that employes are pleased to seek a location there. Dissatisfaction among the vast army of laboring men in South Bend is entirely unknown. The manufacturing plants have adopted a most wise and beneficent policy of rewarding merit and carefully advancing and improving the conditions of their employes.

The factory of the Long Distance Telephone Manufacturing Company is located directly on the main line of the Lake Shore and Michigan Central lines. Within a short distance is located the Grand Trunk, Three I, and other connections. The factory is provided with a sidetrick which receives and delivers freight within ten feet of the factory doors. In addition to these advantages the company owns its own grounds and plant, electric light, heating and power plant, thus enabling it to manufacture upon the most economical basis. At the time of the organization of this company it was the intention to form a compact engineering manufacturing company, to place above everything else the development of the technical part of the business, to which policy it has strictly adhered. All officials and employes occupying executive positions are experienced electrical men, many of them having been identified with Independent telephony since its inception. The following short sketch of the management of the company and its executive officers will bear testimony to the truth of this, what to many would seem, a very broad statement.

C. K. Seibert, Secretary.



Hon. Marvin Campbell, President.

Stanley A. Duvall, Vice President.

The president, Hon. Marvin Campbell, has been identified with some of the most successful and largest manufacturing industries in the state during the past decade. He has been prominently connected with all the moral, political and industrial movements of Indiana and is now actively engaged as president of the South Bend National Bank, and presi-

W. W. Culp, Engineer-Salesman.

L. V. Denis, Manager Cleveland Branch.

Charles A. Davisson, M. E.

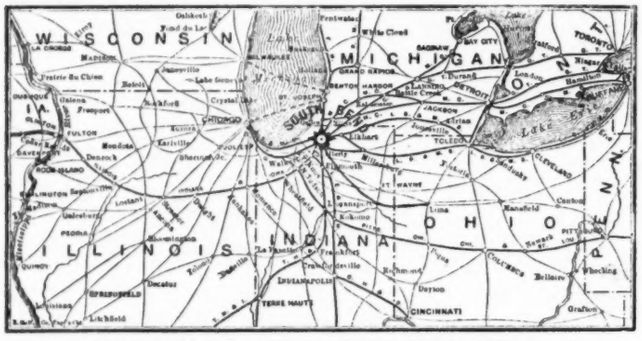
Charles B. Brodrick, Jr. Engineer-Salesman.

George E. Shaw, Engineer-Salesman.

dent of the largest folding paper box company in the middle states. Mr. Campbell, aside from his many years of business experience, has a thorough knowledge of applied mechanics as well as of the manufacturing business.

C. K. Seibert, secretary and treasurer, is a mechanical engineer and has been actively interested and identified with some of the largest industrial companies in northern Indiana. Aside from the important duties of secretary and treasurer, Mr. Seibert gives his attention to the purchasing of the raw material and the handling of the multitude of small details which belong particularly to the telephone industry. Owing to his mechanical training he is enabled to use his knowledge along these lines to great advantage to the company. It is absolutely essential that, while the raw material should be purchased at the lowest market price, it should be carefully seen to that the quality of the material is up to the proper standard, and it is through the efforts of this official that the proper material is secured.

Stanley A. Duvall, general superintendent and vice president of the company, has been identified with the Independent telephone movement since 1893. Mr. Duvall's designs, patents and policies have contributed largely to the success of the Independent telephone field. He gives his company the result of many years of valuable and varied experience in the telephone art. Thoroughness and a conscientious ef-



Geographical Location of South Bend, Indiana.

fort to produce the very highest character of apparatus obtainable has always been his policy.

A very thorough organization has been perfected throughout the factory of this company. The corps of engineers and expert mechanics in the engineering department and throughout the entire factory are men of tried and well known ability. No effort has been made to secure low priced men at the expense of efficiency. The factory corps and its foremen are men who have been thoroughly tried, and are experienced in the manufacture of electrical apparatus. Each department is presided over by an expert in his own particular line of work. Only the most modern methods of manufacturing are used. No substitution of inferior material is tolerated in any part of the apparatus of this company.

Mr. Louis F. Osborne, electrical engineer, formerly with the New England Bell Company, Western Electrical Company, and, for the last three years, associated with the Independent field in this country and Canada, is in charge of the switchboard and special circuit department.

Mr. Anton Swanson, electrical engineer, formerly employed by the Erickson Telephone Company, of Stockholm, Sweden, and the Stromberg-Carlson Telephone Manufacturing Company, is in charge of the transmitter, receiver, generator and ringer departments.

Mr. O. E. Johnson, mechanical engineer, has entire charge of the mechanical manufacture of the apparatus. Under this engineer all the tools and dies are carefully worked out and designed. Mr. Johnson formerly held responsible positions with the Western Electric Company, the Stromberg-Carlson Telephone Manufacturing Company, and also in the punch press department of the American Can Company.

Mr. F. L. Heyer, mechanical and electrical engineer, is one of the best experimental engineers and designers in the telephone field. His work has been entirely along original lines and for a number of years he was associated with the Strowger Automatic Company and later with the Automatic Electric Company of Chicago. To him is due many of the ingenious devices in automatic telephony. His experience has been varied, covering a period of over twenty years.

Mr. Vern Mann, in charge of the assembly of local and common battery telephone department, is careful and painstaking in his work. He was formerly connected with the Western Electric Company, but for the last three years has been identified with companies in the Independent field.

The sales department of any manufacturing concern is the one which deals and comes directly in touch with the public, and in this company this department has been lately enlarged and strengthened by the addition of new men, thoughts and policies. It is the policy of this company to employ only engineers in the capacity of salesmen. It is absolutely essential, however, that these engineers have road experience in addition to their technical training.

Mr. Chas. A. Davisson, a mechanical engineer who has enjoyed seven years of practical road work, represents the company throughout the southwestern states, with headquarters at Oklahoma City, Oklahoma, where he acts in the dual capacity of representative and manager of the branch office. A full line of supplies, telephones and switchboards, and everything pertaining to the telephone art is carried in stock and shipped from this branch in Oklahoma City. To those who are just entering the telephone field in this territory the company is glad to announce that by calling at the sales room in Oklahoma City a switchboard and complete telephone exchange can be seen in operation and full information given upon any subject in which they may be interested.

Another sales branch of the company is located in Cleveland, Ohio, presided over by L. V. Denis, a gentleman of many years' experience on the road, and well and favorably known throughout the entire state of Ohio. This sales department may readily be found at 724 Prospect avenue, where Mr. Denis will be glad to entertain all visitors and furnish any information along telephone lines that may be desired.

Mr. J. W. Culp represents the company throughout Indiana, Illinois and Michigan. Mr. Culp has been identified with electrical manufacturing companies all his life and is competent to furnish specifications and advice upon any technical questions which may come up in the construction of telephone exchanges.

Mr. Chas. B. Brodrick, Jr., a graduate of an eastern technical college, and formerly with the Dean Electric Company, represents the company throughout Missouri and Kansas. Mr. Brodrick has been very successful in his chosen line, and is competent to furnish reliable advice upon subjects in general relative to telephony.

Mr. George E. Shaw, a graduate of the University of Indiana has, for the past three years been interested in the telephone field. Mr. Shaw represents the company throughout Iowa, Minnesota and the Dakotas.

The most important feature to the public at large is the policy of the company. After all is said and done, unless the policy is thoroughly understood it matters little to the public what facilities or character of apparatus is manufactured by any company. The policy of the Long Distance Telephone Manufacturing Company is to respect the rights of others and not endeavor to reap the fruits of other men's brains and efforts. All the designs of this company are evolved through its own engineering and experimental departments. Many of these designs are patented and others are pending and granted. Many valuable patents and inventions have been developed in the transmission of sound. This improvement is in the microphone circuit. This is

not merely an improvement in mechanical lines, but is claimed to be a discovery along scientific investigation.

The company will not attempt to produce any apparatus unless it is thoroughly equipped to turn out the device from the raw material in the most modern and up-to-date method. Nothing is left to haphazard work. Each department is thoroughly equipped. All drillings and fittings are done by steel bushed jigs and templets. The product bears throughout its own characteristic marks, showing skilled workmanship. This condition is only reached by infinite attention to details throughout the entire plant. All the product of the factory is the ripe fruit of many years' experience. The long distance product is claimed to embody all that is good in the telephone field in addition to its own characteristics and perfection of detail. The company is not aiming to see how many telephones it can manufacture per day, but rather how efficient and durable it can manufacture its instruments and improve them. A casual examination of any of the long distance product, it is claimed, clearly demonstrates to the public mind the truth of these statements.

Another gratifying proof, especially to the company, is that throughout the life of its sales department it has never experienced any difficulty in obtaining orders in excess of its capacity until the present writing. At this time the capacity of the factory is enlarged sufficiently to take care of any reasonable growth during the next few years. The motto of the company is, "Not the cheapest, but the least expensive."

STORAGE BATTERIES AND BATTERY PLATES.

The advantages of a properly designed and properly installed storage battery appear in three distinct phases: First, mechanical, as maintaining virtually uniform loads upon generating equipment, enabling engines to be operated at the point of highest efficiency; second, electrical, as maintaining electrical pressure over long lines, despite fluctuations and likewise as preventing electrical losses due to carrying large volumes of current over limited conductors;

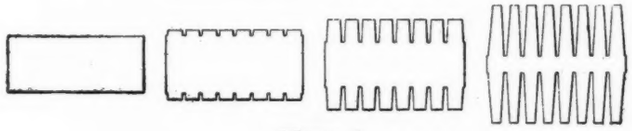


Figure 1.

third, financial, as a result of the other two gains, showing as a smaller investment and lower cost of kilowatt output.

The storage battery is to-day an important and essential part of a complete power plant. Batteries for general power service are of three distinct types: The regulating battery, the floating or line battery as used chiefly on street railway lines, and the boosted line battery. The regulating battery is always installed in connection with a booster through which all current flows, both on charge and discharge. The essential function of the booster battery is to neutralize fluctuations, charging when the current demand

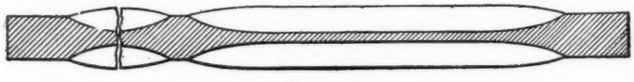


Figure 2.

is light, discharging when the current demand increases above a predetermined point, thus maintaining a practically uniform load upon the generating equipment. During hours of very light load the engines may be entirely shut down and the battery furnish all power required. The line or floating battery has no booster or other charging equipment. It is simply connected across the circuit at points distant from the power house where the pressure drop under fluctuations is considerable. When the current demand is light, the e. m. f. of the line exceeds that of the battery and current is absorbed. When the current demand causes the line pressure to drop below the e. m. f. of the battery, discharge takes place, so that voltage fluctuations are minimized. The boosted line battery as used on long lines entails the erection of a separate feeder line direct to the battery, the voltage of which is raised by a booster in the power station to any necessary extent above the line voltage to compensate for drop. This provides one auxilliary service of supply to the battery.

There are two distinct economies in lines batteries. First, the savings on cost per kilowatt delivered due to the elimination of large voltage losses on a given amount of current transmitted and, second, the smaller investment in copper conductors required to transmit the extreme ampere demand within the limits of allowable voltage drop. It is a fact too little appreciated that the first cost of a line battery is often very much less than of copper feeders sufficient to secure anything like equivalent effect. As evidence of the extent of these economies, it may be stated that the line batteries installed by the Gould Storage Battery Company have frequently saved their entire cost in less than eighteen months.

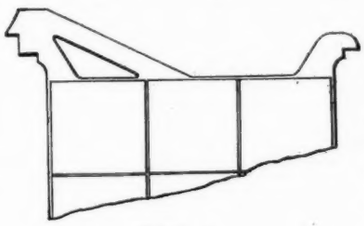


Figure 3.

The battery is the controlling factor determining the efficiency, the capacity, endurance and life of any storage battery. The requirements of lead storage battery plate as given by Lamer Lyndon, M. E., in "Storage Battery Engineering," are substantially as follows:

1. Uniform resistance throughout grid to secure even current flow through, are portions of active material.
2. Allowance for expansion and contraction of active material during discharge and charge.
3. Close electrical contact between active material and support plate.
4. Freedom from local or secondary action.
5. Provision for ample circulation of acid electrolyte.
6. Large surface of active material exposed to electrolyte.

The following brief description of the Gould Battery Plate and the accompanying illustrations serve to explain to how great a degree this plate fulfills the theoretical requirements as set forth above: The Gould plate is of the Plante type, so called, in which the active material—lead peroxide (PbO_2) of the positive and spongy lead (Pb) of the negative—is formed electro chemically out of the lead composing the support plate or contact surface.

Figure 1 is a fragment of a Gould plate, illustrating the manner in which the large contact surface for active material is developed out of a sheet of rolled lead cut to the size and shape of the plate. This "blank" is placed between two shafts on which are mounted sets of rapidly revolving steel discs with spacing washers. These discs are pressed against the plate and moved to and fro, working into the lead farther and farther, and spinning the metal between the knives up into thin parallel ribs.

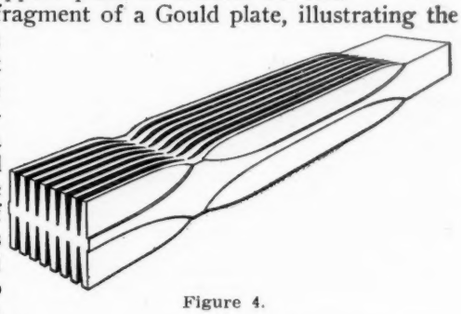


Figure 4.

Figure 2 is a longitudinal section of a fragment of a plate, and shows the web of metal left as a central con-

ductor and also the diamond shaped cross conductors and current distributing bars.

Figure 3 is a perspective drawing of a small fragment of finished plate, and very clearly indicates the character of the construction. The active material is formed out of the lead composing the contact surface between the ribs, filling the spaces with closely packed but highly porous active material. Expansion and contraction can not cause loosening or falling out of the active elements, and the closest electrical contact is preserved.

Figure 4 shows the double conducting lug by means of which better distribution of current is secured. Only chemically pure, densely rolled lead, is used, so that secondary actions leading to "self-discharge" are therefore impossible. The Gould plate is absolutely integral; no lead is removed or added in making the plate. The blank is merely changed in form. The ample provision for circulation of electrolyte and the large contact surface presented for securing high efficiency and long life.

In addition to batteries for power purposes the Gould Company is manufacturing types for telephone, telegraph and signal service, for train lighting and electric vehicles.

A BARGAIN BULLETIN.

The Bigley Telephone Company, 56-58 W. Van Buren street, has issued "Bargain Bulletin No. 1," descriptive of special bargains offered in new, second-hand and rebuilt telephones, switchboards and supplies. Quite an interesting list is offered and it is probable that almost every operating company will be able to find therein something of benefit to it. The Bigley Telephone Company wishes to get a copy of this bulletin into the hands of every prospective purchaser.

A. J. COX & CO.'S TELEPHONE SPECIALTIES.

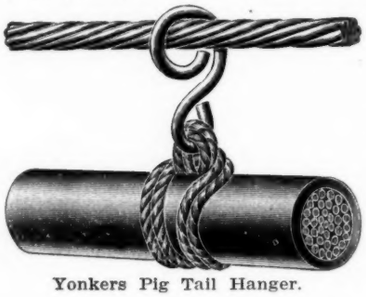
The French Battery Company has recently appointed A. J. Cox & Company, Chicago, general agents for its "Fleur de Lis" battery. This firm, and particularly its leading factor, Mr. Albert J. Cox, is widely and favorably known throughout the telephone field. Mr. Cox has won special favor with the trade by inaugurating a follow-up system for all orders placed by his patrons, with a view to eliminating those disagreeable features which occasionally result from negligence or delay. He feels that this system will make it easier for patrons to secure materials through his agency than from any other source, and all he asks is an opportunity to prove this by means of a trial order.

Mr. Albert J. Cox, of A. J. Cox & Co., Chicago.

Mr. Cox has enjoyed a wide experienece in the purchasing of all kinds of telephone materials and supplies, and he offers his friends and patrons the benefit of this experience, free of charge. He will be found always anxious to serve customers in this respect, as well as supply them with his regular line of goods, which embraces such specialties as seamless telephone receiver shells, mouthpieces, handles, knobs, switchboard terminals; vulcanized fiber, in sheets, rods, tubing and finished shapes; German silver and phosphor bronze, in sheets, tubes, rods, wire and rope; platinum, in sheet, wire or rivets; porcelain, for various electrical purposes, and dry batteries in all sizes.

A NEW MARLINE CABLE HANGER.

The Yonkers Specialty Company, of Yonkers, N. Y., manufacturers of the well-known "Metropolitan" cable hangers, is manufacturing a marline hanger, with a peculiarly shaped hook, known as the "pig-tail" type from its resemblance to the form of that well-known appendage. It is said that "one cannot make a whistle out of a pig's tail," but it has its uses, and in this instance it has suggested a name for this hanger, if not the design.



Yonkers Pig Tail Hanger.

There is a growing demand in these days of careful construction work for the kind of marline hangers which will not easily come off the supporting strand, and which does not have to be pinched on to the supporting strand by the line man. This new hanger is designed to supply this demand. It is as easy to apply as the ordinary marline hanger, and when in place is held by the marline loop so that the plane of the hook is perpendicular to the strand. In this position it is impossible to detach, and at the same time the point of the hook is so located that it will not catch wires from the running board and snarl everything up, an accident which often occurs when an attempt is made to add new line wires to a pole line carrying cable.

The factor of safety is greater with this form of hook than for any "s" shaped hook of similar sized wire, and under test hangs on to the supporting wire until the curl of the hook is completely straightened out. The hook is carefully galvanized after being bent, and furnished with a fine grade of house-line. The Yonkers Specialty Company claims that its "pig-tail" hangers have been in service, experimentally, for several years and have proved so successful that it feels justified in putting them actively on the market.

ARTISTIC NAME PLATES.

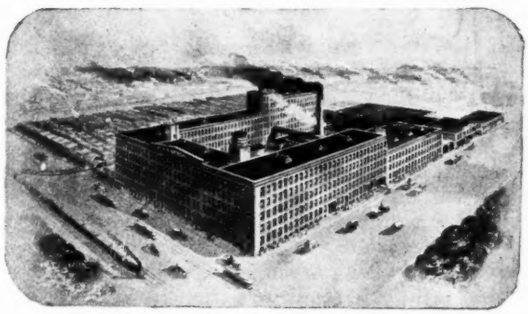
Mr. Harry A. Ford, widely known throughout the telephone field as western representative for the Haeusermann Metal Manufacturing Company, with offices in the First National Bank building, Chicago, reports a very successful season for his line of goods. The Haeusermann name plates are sold under the guarantee that nothing better can be made, and are claimed to be the acme of artistic skill and mechanical perfection. They will compare favorably in point of price—items of the highest importance which are to be considered when one wishes to set off a piece of apparatus to the best advantage. Telephone men who desire their goods to make a good impression upon prospective customers, will find that a tasty and effective name plate counts as an important factor in producing such results. A name plate is one of the first features upon which the eye rests when inspecting telephones or switchboards, and the impression which it produces must contribute largely toward the effect which one's apparatus produces upon the prospective buyer, being, as it were, a kind of business card, indicative of the quality and character of the manufacturer's output. The Haeusermann Metal Manufacturing Company is one of the oldest and strongest concerns in the field,

having factories in both this country and Europe, as well as offices in Chicago and New York. This concern manufactures a patented, etched plate of a finish and durability which is claimed to be superior to any other name plate on the market.

Mr. Ford, of the Chicago office, has made a distinct specialty of the telephone trade, and his efforts have been crowned with a gratifying measure of success. He invites correspondence from concerns which may be in the market for such goods at this or any future time, and will devote particular attention to seeing that they secure an artistic sketch before the plate is given to the factory for completion.

THE ANDREWS WIRE OPERATOR'S CHAIR.

Within the last year or two a great many telephone exchanges have replaced their old style wooden operator's stools with the more modern and attractive metal chairs. That this style of equipment is destined to even greater popularity in the future seems assured. Its sales are steadily increasing and the better acquainted operators and managers become with the wire chair the more they seem to like it. Of course, there is a difference in wire chairs, the same as in wooden ones. A cheap wire chair of unreliable make will sometimes warp and collapse, so that it is always advisable to buy a standard article, produced by a thoroughly responsible concern.



Factory, A. H. Andrews Company.

For telephone exchanges there is said to be no furniture so thoroughly harmonious, convenient, lasting and inexpensive as the metal (steel rod) furniture made by the A. H. Andrews Company, Chicago. The frame work is of best Bessemer steel rods, twisted and interwoven (patented); the wood work is of oak or birch, mahogany finish, as preferred; the metal work is handsomely and durably plated in Japanese copper finish, making the chair not only handsome in appearance but comfortable and convenient, and so durably made that it is claimed it will last a life time.

Switchboard Operator's Chair, No. 78 M.

The accompanying illustration shows the company's popular switchboard operator's high chair or stool, No. 78M. Those who have used this chair say that for the operator's use there could be nothing more suitable, comfortable, convenient and lasting. It has every possible adjustment; the back can be raised or lowered or thrown in or out, as desired, to suit the occupant. The back is springy and at all times gives supporting ease to the user. The seat is revolving and adjustable in height, susceptible of being raised or lowered as desired. The foot rest is of metal. This chair is made in two sizes, one on which the seat adjusts from 24 to 28 inches in height, while on the other the seat adjusts from 28 to 34 inches in height.

Operator's Chair, No. 78 A. M.

Another style of switchboard operator's chair, made with a stationary spring back, is shown in No. 78 A. M. The other essential features of this chair are the same as in No. 78 M. In No. 83 M. is shown a chair for the chief operator or toll board. This chair is constructed on the same lines as No. 78 M., with adjustable back that can be raised or lowered and extended from the seat. It has a revolving seat made in oak or birch, mahogany finish. The metal parts have a Japanese copper finish. One height only is built in this chair, and it has a range from 18 to 24 inches.

Among the points of superiority claimed for the Andrews metal furniture by the company are the following:

"No furniture compares with it in beauty. It is an attractive addition to any place of business, being light, airy and graceful, in striking contrast to the heavy, cumbersome style of furniture.

Chief Operator's Chair, No. 83 M.

"No furniture equal it in strength. The framework is of Bessemer steel rods, twisted and interwoven (by a patented process), making the furniture rigid and firm, indestructible and wear proof.

"In point of cleanliness there is nothing to compare with this furniture. Its metal framework does not attract or invite dirt as does carved or turned wood work. It is always clean, bright and attractive. The metal work is beautifully plated and will retain its luster and polish indefinitely, if lightly rubbed once a week with a dry cloth.

"Notwithstanding its superiority, the price compares more than favorably with prices asked for old-fashioned furniture, and when one takes into consideration that one piece of this furniture will outlast several pieces of the old-fashioned kind, this is considered by far the cheapest furniture.

"The Andrews steel rod chair is the original article in this line, and it is built by one of Chicago's largest concerns. A reputation of thirty years stands back of it.

ELECTRICAL MEASURING INSTRUMENTS.

Machado & Roller, New York, are issuing a new price list and descriptive catalogue of their celebrated Whitney electrical measuring instruments. To emphasize still further their confidence in their goods and to insure the complete protection of their clients' interests, Machado & Roller now permanently attach to each of their instruments, when it passes its final inspection and test, a guarantee label guaranteeing materials, workmanship and calibration, and that any recalibration, readjustment or repair that may be required within a year's time will be effected gratis on return of the goods f. o. b. factory, with seals intact for that purpose.

SECOND ANNUAL ELECTRICAL SHOW.

The Electrical Trades Exposition Company wishes to announce the opening of its permanent headquarters at Nos. 1006 and 1007 Monadnock Block, Chicago. The second annual electrical show will be held under its management at the Coliseum, Chicago, Ill., January 14 to 26, 1907, inclusive. A limited number of spaces are still open and will be sold in the order of receipt of applications.

TRADE NOTES

ARMOUR INSTITUTE OF TECHNOLOGY, Chicago, announces a course in telephone engineering for evening classes.

THE LYON METALLIC MANUFACTURING COMPANY, manufacturers of steel factory equipment, metal lockers, etc, recently removed from Chicago to Aurora, Ill. The firm still retains a Chicago office at 1211 Marquette building, which is in charge of Mr. L. Wilkinson.

THE INTERNATIONAL CORRESPONDENCE SCHOOLS at Scranton, Pa., held special exercises October 16 in honor of the fifteenth anniversary of the founding of the schools. This institution is widely known throughout the telephone field because of its course in telephone engineering.

THE CHICAGO CEDAR POLE COMPANY, whose advertisement appears in this issue of TELEPHONY, has an exceptionally complete stock of poles on hand for all telephone purposes and is prepared to quote extremely interesting prices. Inquiries are requested from all prospective purchasers.

"A TELEPHONE ENCYCLOPEDIA, describing everything from an ammeter to a zinc battery"—that's the way the Julius Andrae & Sons Company, of Milwaukee, Wis., describe their catalogue No. 24. The book is profusely illustrated and would be a valuable addition to the library of every telephone man. The Andrae company will gladly send the book to interested parties.

THE UNIVERSAL CABLE GRIP COMPANY of Syracuse, N. Y., has been granted fundamental patents covering all forms of cable grip manufactured by it as illustrated in its advertisement on another page of this number of TELEPHONY. The company is now prepared to promptly meet all calls for its grips which are already firmly established as indispensable for safely and speedily drawing in cables of any size or length. Illustrated information may be had on application.

MANY MANAGERS of rural telephone lines are testing Andrae condensers by having them in actual operation. The Julius Andrae & Sons Company, of Milwaukee, makers of the Andrae condensers, equip party lines free of charge for a period of time long enough to insure a thorough trial. Messrs. Andrae & Sons attribute their large sales in this line to the fact that the Andrae condenser is extremely simple, positive and does not decrease the efficiency of the talking in the slightest degree.

THE WESTERN TELEPHONE MANUFACTURING COMPANY, of Chicago, is now installing at Mandan, N. D., what is said to be one of the most complete modern central energy plants of its size in the northwest. The Western company has furnished all of the equipment including the main office switchboard which is of latest central energy type, power equipment and central office protection. All the telephones are also of latest improved Western patterns. A further description of this plant will appear in an early issue of TELEPHONY.

GREAT IMPETUS has been given the sale of long distance telephone throughout St. Joseph county since the announcement of the purchase of the Home Telephone Company of South Bend by the Automatic Electric Company of Chicago, and its intention to build a toll line to connect South Bend with the Chicago automatic exchange. This will be the first Independent toll line connecting Chicago with the surrounding country and as the service will be high grade and strictly long distance in its nature, the apparatus will be supplied by the Long Distance Telephone Manufacturing Company of South Bend, Indiana.

THE DULUTH LOG COMPANY, Duluth, Minn., is prepared to handle with dispatch orders for telephone poles in all lengths. This firm has exceptionally complete stocks of poles and its numerous yards, located throughout the cedar producing sections of the country, enable it to ship to almost all localities to advantage. One of its yards with a complete assortment is at the head of the Great Lakes, located on the water front, with switching connections to six different railways. Its loading facilities are, therefore, of the best, and it can be readily seen that rush orders can be handled with prompt dispatch. The Duluth Log Company is prepared to accept orders for spring delivery or for immediate shipment.

"COPPER GOSSIP," issued by the National Conduit & Cable Company, New York, publishes the following views on the general business outlook: "The phenomenally prosperous conditions hitherto noticed continue to be in striking evidence. An immense volume of business is reported, and practically every industrial section of the country is unprecedentedly active. There is a strain put upon existing facilities to meet the tremendous demand that has arisen. Brilliant harvest prospects keep the optimistic spirit keyed up to a high pitch. The outlook for another year of general and marked prosperity is encouraging to an unwonted degree, and numerous factors unite to prolong the greatest business movement the country has ever experienced. Trade and industry are prepared to move forward under the impulse of a still greater momentum."

IT WAS BUT A FEW WEEKS AGO that the Monarch Telephone Manufacturing Company installed one of the largest magneto transfer boards built during the past two years. The same company now has an order and is building an 800-line semi-multiple board to be installed in Macon, Mo. A three-position toll board is also being made and both equipments will be placed in a new building now being built by the Macon Telephone Company. When this exchange is completed it will undoubtedly be one of the best of its kind in the country. Four-party selective service is being given in Macon and the new switchboard will have four-party indicating selective keys in the cord circuits. Instead of providing a master key for each position, each cord equipment will have its indicating four-button key. A chief operator's desk and a wire chief's desk complete the equipment for the new exchange. Both of these desks will be fitted with all up-to-date appliances for supervising the work of the local and toll operators and for making tests on the lines.

FRANK B. COOK believes that he has smashed all records of every kind with his No. 10 protector, furnished to the Kinloch Telephone Company, St. Louis, for its new exchange. In the first place, the order was for 16,000 pairs, the largest single protector board ever installed. The No. 10 protector was designed especially for the Kinloch Telephone Company and had to be designed and manufactured in a hurry. Under such unfavorable circumstances a manufacturer's cup of woe is generally full and running over when it comes time to install the apparatus, for, as a general

rule, troubles without number spring up in the most unexpected places. Switchboard manufacturers have had more than their share of those troubles which do not show up even after an endless amount of experimenting in the laboratory and in the first model. Contrary to all precedent and rule, Cook's No. 10 protector developed none of the customary eccentricities. The protectors were installed by the Stromberg-Carlson Telephone Manufacturing Company, and when the cut-over was made, only nineteen cases of trouble were found in the entire 16,000 pairs. Only two of these cases of trouble were spring troubles, due to slight faults in the assembling. Mr. Cook is confident that this breaks all records along this line, and it is really small wonder that he feels considerably elated. Mr. Cook says he is now in position to fill orders for the No. 10 protector, and will be very glad to mail a new descriptive circular to any inquirers.

MOODY'S MANUAL.—Moody's Manual, issued by the Moody Corporation, 35 Nassau street, New York City, has just made its appearance in a handsome volume of over 2,800 pages. It is more useful and valuable for reference than ever. The electric traction section embraces statements of practically all the street railway and traction companies in the United States and Canada. Full reports are given as to charters, franchises, capitalization, dividends, debts, income, plant and equipment, officers and directors, including superintendents and purchasing agents. Industrials have been Moody's especial field from the first issue, and in this division its lead is absolute and unquestioned. The fifth section, devoted to gas and electric lighting companies, is especially complete with over 1,000 entries, as to large corporations. The franchise provision, always a vital factor in the estimate of these quasi-public utilities, is clearly set forth, as well as the equipment, capitalization, earnings, management, etc. There are 734 more entries in this section than in the three other best known hand books combined referring to the same subjects. In the telegraph, telephone and cable section, Moody's Manual is equally copious and satisfactory. These two sections are notably complete and especial effort has been made in the section last named to exclude all paper schemes. The manual also contains statements of upwards of 8,000 banks, trust companies and financial institutions, showing capital, surplus, profits, deposits, par value of shares, rates and dates of dividends, price of stock, officers, directors and correspondents; statements of American and foreign government and state securities and membership list of 27 different stock exchanges in the United States and Canada.

FRENCH DRY BATTERY COMPANY.

The French Dry Battery Company, Madison, Wis., has no traditions upon which to lay claims to recognition by the telephone and electric trade. Its organization and growth has all been since the beginning of 1906. The product of the company, however, is the result of scientific study, dating from the early introduction of dry batteries in the commercial field, and it to-day aims to represent a constant improvement and real achievement. The organizers of the company thought they were sound in judgment in concluding that the great middle west and its tributary territory, north and south, would recognize in time the advantage of receiving prompt shipment of dry cells from a factory nearer than the previously established sources in the east, and were doubly confident that the superior quality of cell which they proposed to offer, would assure ultimate success. The cordial reception of "Fleur de Lis" batteries by consumers not only in the chosen territory but as far away as in the maritime provinces of Canada has necessitated reorganization of the company twice since its first establishment in Chicago, to equip it properly to meet demands and to reasonably provide for the growth of business already in view.

On September 1st, the first French battery was made in the new factory of the company at Madison, Wis., which represents an investment of over $25,000. The capacity of the present building is about double the number of standard size cells which the company is marketing at this time, but if the past six months is indicative of the future demands, another task of expansion must be undertaken soon.

There is cause for such demand for an article which is not a novelty and which must find a place for itself by displacing an old and established article. That a dry cell made by this company can be purchased, which will indicate on an ammeter over fifty amperes of current is certainly an unheard of achievement. Some may pronounce this a "freak" but even freaks do not occur without latent cause and if such freaks can be produced at will, it must be that dry cells can be adapted to do the special work for which they are employed. This company is making special cells for telephone work which are different in composition from the cells it is supplying to gas engine users, and still different from the ones for autoists. Perhaps this has something to do with the success of "Fleur de Lis" batteries.

Messrs. A. J. Cox & Company, Chicago, are general agents for this well-known make of batteries.

THE WESTERN ECONOMIST TELEPHONE.

The Western Telephone Manufacturing Company, Chicago, has been getting out some very good advertising matter of late. We reproduce some of the "convincing" arguments which the Western has been sending out on its new "Economist" telephone.

Western Economist Telephone.

"Noah Webster, when he compiled his first great dictionary, defined an economist as 'one who expends money, time or labor judiciously and without waste.' This definition of Webster's cannot be improved upon as a concise, clear statement of the essential elements of an economist.

"The design of the Western Economist telephone built by the Western Telephone Manufacturing Company of Chicago, 'the pioneer Independent telephone factory,' shows how closely a modern telephone can be built in accordance with Webster's definition of an economist.

"In the first place, the Western Economist telephone is the most compact type of cabinet telephone ever placed upon the market. The Economist is built in all the standard series and bridging sizes and is more compact in construction than any other telephone made for the same classes of work. We have used the word 'built' purposely. The telephone is not merely 'constructed' or 'manufactured' but it is 'built.' The foundation is laid in a strong, simple cabinet made of the best quality of seasoned dry lumber, scientifically finished and polished like a piano. The joints are made to last; the screws that fasten the cabinet together are long and are put in to stay; the hinges are big, solid and fastened securely in place. Every part of the cabinet is built to last a life time, to stand hard usage, rough treatment in shipment and abuse in service.

"Then the operating parts of the Economist telephone are put into their places. The ringer frame is mounted on the

door solidly, squarely and securely; the gongs are adjusted to their proper places and are locked in place; the transmitter arm is screwed or bolted on, either way, it arrives in the customers's hands on the door where it belongs, not loose in the box or broken off.

"The generator is on the bottom shelf of the cabinet, the crank projecting at the lower right hand side of the box. The generator simply can not be jarred or broken loose. The induction coil is mounted just above the generator on the upper shelf and right above is mounted the switch hook. These two light parts instead of the heavy generator being the only operating parts supported by this upper shelf. The batteries are set behind the switch hook on the upper shelf, ample space being left above the batteries for the ringer to swing into its place.

"All the wiring is down in front where you can put your finger on it and look at it and see every inch of it. Every connection is well soldered. Any man who owns a pair of hands in good working order, one eye that can see, and a ten cent screw driver, can make any repairs ever required or replace any parts on a Western Economist telephone. This is simply a plain statement of facts. Don't take our word for it—convince yourself. We will send you one or more Economist telephones in any size you desire for any class of work and pay all freight charges both ways, if after sixty days' trial you are not convinced that this telephone is the telephone for you.

"It will save you repair bills; it has less parts than any other telephone; the wiring is simpler; it will not overwork your 'Telephone Troubles, And How to Find Them' book; it will use less battery; it will cost you less to start with; it won't wear out your patience; it won't waste your time by giving poor service or quitting work. The purchase of a Western Economist telephone means the expenditure of money 'judiciously and without waste,' It means using your time when you telephone 'judiciously and without waste.' It means that the labor of installing it and keeping it working is employed 'judiciously and without waste.' Webster's Dictionary says it is an 'Economist' for you and it is."

THE NATIONAL CABLE HANGER.

The National Telephone Supply Company, Cleveland, Ohio, has just put on the market a new cable hanger which no doubt will meet with considerable favor among the telephone and jobbing trade. This new hanger will be known as the National cable hanger. Several good points are claimed for this style of hanger, one of which—and probably the most important—is that it is impossible for the hanger to become detached from the messenger strand. The manufacturer of this new cable hanger, and its product are well known to the telephone trade. The high quality of material which it has always used, prompt shipments, and reasonable prices, have secured for it a steady and increasing growth in each year's business. Prices and samples of the National cable hanger may be obtained from any jobber.

New National Cable Hanger.

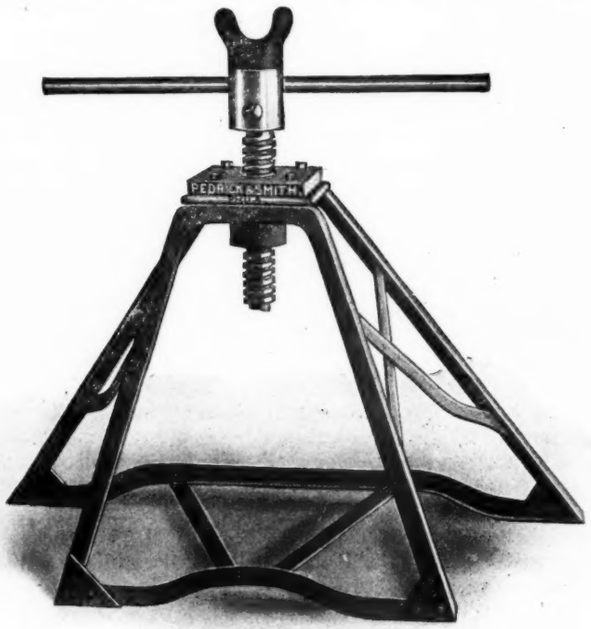
"HOW TELEPHONES ARE MADE."

The Chicago Telephone Supply Company of Elkhart, Indiana, has published a handsomely illustrated booklet, entitled "How Telephones Are Made." This book, in addition to giving a detailed description of the various processes employed at Elkhart to produce telephones which satisfy, presents a very interesting story of the origin, growth and achievements of the Chicago Telephone Supply Company in narrative form. The company has devoted twelve years of careful study and hard work to developing what it considers the finest line of telephone apparatus in existence, with especial reference to the requirements of party line work. In that twelve years the concern has grown from a small concern with very limited capital to one of the largest manufacturing concerns in the country, having a capitalization of half a million dollars.

Every person interested in the telephone industry, whether from a public or a commercial standpoint, will find entertaining reading in "How Telephones Are Made." The booklet will be mailed, free, upon request.

A NEW CABLE JACK.

The fact that most devices on the market for handling the large cable drums in connection with the laying of underground cable are heavy, clumsy and unsatisfactory in many ways, as well as the fact that the laying of underground cable increases enormously each year has led to the invention of the clever device illustrated herewith. This



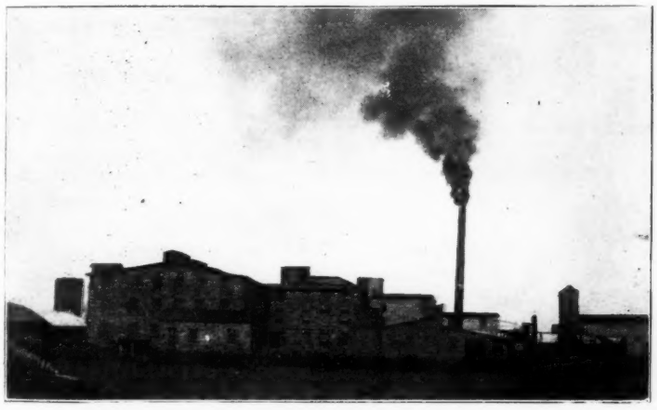
A New Cable Jack.

device weighs but sixty pounds, and is readily portable, yet strong and rigid, handling the heaviest drums in the most stable manner. When the drum is revolving, not the least vibration is observed. Steel angles, strongly braced, form the stand, and the construction of the stand is the secret of combining strength with lightness. These jacks are used in pairs, one supporting each side of the drum which revolves on an axle. The cut shows a jack ready for a drum. The side that faces in the direct foreground is the side that stands next to the drum and is hereinafter referred to as the inner support, the opposite side being accordingly referred to as the outer support. The inner support is constructed to take up as little room as possible and to allow the drum to revolve as near the jacks as possible. It has very little slant toward the drum. The slant consists of just one and one-half inches from perpendicular. This feature adds strength as it allows the drum to revolve close to the supporting jacks as before stated. The spread of same just covers fourteen inches, which does not interfere at all with the man operating the drum. This feature also permits of placing the drum nearly over the man-hole or aperture in which the cable is being laid. The supporting feature is vested in the outer support. The slant of same

from the drum is five and one-half inches from perpendicular. The spread of same is thirty-six inches. Toppling in any direction is impossible. The drum revolves as firmly on these jacks as if it were on solid masonry, and there is no perceptible vibration or tilting as the weight is evenly distributed. The screw is of heavy pitch, and of such pitch as to elevate the drum rapidly with little effort. On the whole, the appliance is said to be superior to anything on the market; it possesses all features required of such a device. It is manufactured by Pedrick & Smith, of Germantown, Philadelphia, Pa.

THE CLAY PRODUCT CO.—TELEPHONE CONDUITS.

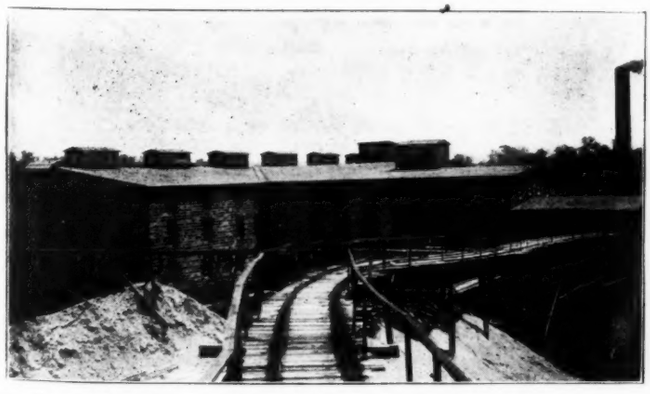
The Pierce Specialty Company, in addition to the manufacture of its own specialties, has for sometime been acting as sales agent for other manufacturers of material fitted to telephone and electric light construction work, among



Plant of Clay Product Company, Brazil, Indiana.

these concerns being the Continental Clay & Mining Company of Brazil, Ind., manufacturers of conduit and other vitrified clay ware.

Some two months ago the Peirce Specialty Company took advantage of an opportunity offered it to purchase the plant of the Continental Clay & Mining Company and has now organized an Indiana corporation under the name of The Clay Product Company and has undertaken the extensive manufacture of vitrified clay conduit for telephone and electric light use. Two photographs of the company's plant



Another View Clay Product Company's Plant.

are reproduced in connection with this article. The plant has a capacity of about 6,000,000 duct feet of conduit per year, and is now running at full capacity.

Exceptional success has been attained in the ware manufactured since The Clay Product Company was organized, and extensive improvements made by the new owners have already shown their value.

Mr. H. H. Titsworth, for sometime in charge of the Peirce Specialty Company, is president of the Clay Product Company and will spend a considerable portion of his time at the plant.

Mr. Robert A. Peet, until recently general sales agent in Chicago for the Hazard Manufacturing Company, is now in general charge of the Peirce Specialty Company. Mr. Peet has been interested in the Peirce Specialty Company for sometime past. Although th same men are identified with the Clay Product Company who are interested in the Peirce• Specialty Company, the two corporations will be conducted separately, the Peirce Specialty Company continuing to act as sales agents for the Clay Product Company.

GEORGE W. WILDER, TELEPHONE ENGINEER.

Prof. George W. Wilder, Ph. D., has severed his connection with the Armour Institute of Technology and has opened an office in the Monadnock building, as a telephone engineer.

Prof. G. W. Wilder.

Prof. Wilder graduated from the University of Wisconsin in 1896. After teaching two years at the same institution in the physics laboratories, he went abroad and spent two years in the National Swiss Polytechnikum at Zurich. His work at this institution was devoted to electricity and telephony. After gaining the degree of Ph. D., he returned to Wisconsin, where he taught engineering physics and electrical measurements for three years. In 1903, Dr. Wilder entered Armour Institute of Technology as assistant professor of electrical engineering, his work consisting of electrical measurements and telephony. During his three years' connection with the institute he has built up a department in telephone engineering that has attracted wide attention.

Prof. Wilder has also had considerable practical experience in telephone matters as well as a thorough technical training. He has been identified with several telephone companies during the past three years, besides making several important investigations. He was technical editor of a telephone publication for a period of two years and wrote his book "Telephone Principles and Practice," which has been favorably received among telephone men.

THE UNIVERSAL POST HOLE DIGGER.

The Universal post hole digger, manufactured by F. E. Kohler & Co., Canton, O., is said to work satisfactorily in all kinds of soil, and is claimed to be stronger and more durable than any other digger on the market. It is particularly adapted for use by telephone, railroad and telegraph companies by reason of its construction and capacity for digging, the bowl being so shaped as to form a pocket when the bowl is closed down against the digging blade. The Universal post hole digger is made in three sizes, as follows: No. 1, 4′ 10″, which will dig a hole 2′ 8″ deep; No. 2, 5′ 10″, which will dig a hole 3′ 8″ deep, and No. 3, 8′ long, which will dig a hole 5′ 11″ deep.

One telephone company in Michigan writes: "They are certainly 'the thing.' It will pay any telephone company

using post hole diggers to take this matter up with the manufacturers and give this make of diggers a trial."

CENTURY'S CANADIAN FACTORY.

The Century Telephone Construction Company, of Buffalo, New York, is first among the large manufacturers of telephones in the United States to recognize the growing

importance of the Canadian trade by establishing a branch factory in that territory.

A large establishment, with complete equipment and a full line of supplies, has recently been opened at 53-59 Adelaide street, West, Toronto, and one of the Century's best known men, Gustav F. C. Bauer, has been appointed manager. Mr. Bauer, while a young man in appearance, is old in telephone experience, having enjoyed practical work in almost every phase of the industry, and is noted for his correct and persevering methods as well as for his personal popularity.

G. F. C. Bauer.

He already possesses scores of friends throughout the Dominion and his new line of work will enable him to extend and cement this acquaintance.

H. A. Nutall, who will travel the Canadian territory for the new house, is well known to the telephone trade of both the United States and Canada, and is a popular hustler who will vigorously and intelligently promote the interests of the new factory in Canada.

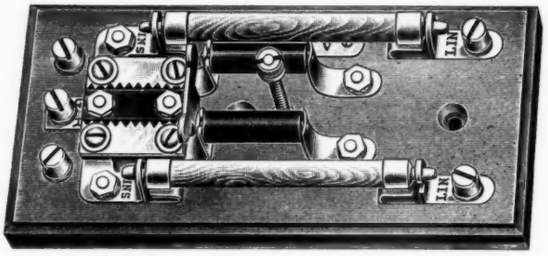
F. M. Barnard, who has for some years been connected with the Buffalo house of the Century company, will look after the office of the new establishment.

The Century will doubtless add fresh laurels to its already highly successful record by means of its Canadian branch. Canadian operators have already manifested deep interest in the establishment of this plant, as it will afford them an opportunity to buy first-class goods in their own country, without the necessity of dealing with custom-house officials. The general opinion is that the doing away with this red tape alone will bring a large business from the very start.

REGARDING INDIVIDUAL STATION PROTECTION.

For a long time the Independent exchange manager fought the idea of an individual station protector, not deeming the telephone worth the expense of protection, but a few damage suits for lives and property destroyed have changed the aspect of the case.

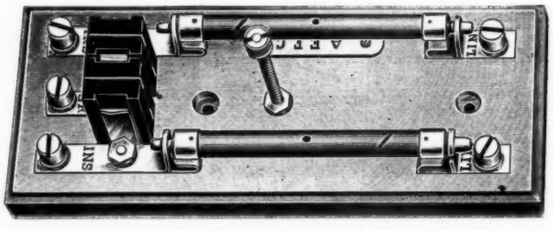
The law holds, "That a telephone company having reasonable grounds to apprehend that lightning or other dangerous electrical currents will be conducted over its wires into a house or other building where it maintains an instrument under contract with a subscriber and then do injury to person or property, must exercise due care in selecting, placing and maintaining in connection with its wires and instruments, such known and *approved* appliances as are reasonably necessary to guard against such accidents; and for failure to do so will be liable for such damages as result from its negligence."



American, Number 999.

In order to fully protect its customers the American Electric Fuse Company of Muskegon, Michigan, has designed and placed on the market various types of individual station protectors, all of which have been approved by the National Board of Fire Underwriters and are listed by them, thus guaranteeing immunity from damage suits to the users of this apparatus.

Insurance inspectors all over the United States have orders to pass as approved protection each of the types illustrated herewith.



American, Number 990.

The No. 999 is a combined heat coil, tubular fuse and carbon lightning arrester, mounted on heavy glazed porcelain base, and furnished with a pressed steel cover. The heat coils are of an improved self-soldering type, made to operate in accordance with standard specifications for heat coils. The tubular fuses are made of either wood or fibre as preferred, and are lined with asbestos braid enclosing the fuse wire. The lightning arrester is of the saw-tooth type with carbon ground plate. It is self-cleaning, dust-proof, has large discharge service and is adjustable. The standard adjustment is for .005 of an inch air gap. The mountings of the protector are of heavy whitened brass; the spring contacts are the most positive made, the tubular fuse being held in place by the well-known American hook contacts with stiff German silver reinforcing springs. The line, in-

strument, and ground connections are made either with screw nuts as shown in the illustration, or with knurled thumb nuts as desired. The screw holes on the bottom of the porcelain base are filled with an approved insulating compound. The line, instrument and ground wires enter the protector from the ends, passing through fiber bushings in the steel cover, as shown in the illustration.

No. 990 individual station protector is a combined carbon lightning arrester and tubular line fuse mounted on a heavy glazed porcelain base. The carbon lightning arrester consists of flat carbons separated by mica dialectrics, but allowing a large discharge surface. The tubular line fuses are similar to those used on the No. 999 as described above.

Cover Used on 990-991-998-999.

Both of these protectors have been approved by the National Board of Fire Underwriters.

Catalogue No. 31 fully describes a large number of all kinds of protective devices and will be cheerfully mailed to all who send a request to the American Electric Fuse Company, Muskegon, Michigan.

HIGH GRADE TELEPHONE WIRE.

The Indiana Steel & Wire Company, of Muncie, Ind., prides itself upon the high quality of its telephone wire, and as there are inferior makes of wire on the market, the company urges prospective purchasers of wire to make careful tests to determine the quality of goods before buying.

Twenty-five cents expended for a bottle of saturated solution of sulphate of copper for testing galvanizing may save several hundred dollars and improve the service of lines. Any druggist can prepare this solution. There is a vast difference between fence and telephone wire aside from the galvanizing. Telephone wire is made of high grade material, which costs considerably more than Bessemer steel such as is used in the manufacture of fence wire. To get the maximum amount of conductivity, with the minimum amount of resistance, material of proper analysis must be used. Telephone wire is galvanized with pure zinc, which costs almost double the price of spelter such as is used in the galvanizing of fence wire, to say nothing of the extra amount required to double galvanize it. A mill can only produce from one-third to one-half as much telephone wire as of fence wire; besides, it requires special machinery and attention, which, together with the superior quality of material, accounts for the difference in price and quality. The company states it behooves the user of telephone wire to take every precaution against inferior wire.

DEAN GETS DETROIT CONTRACT.

One of the largest Independent switchboard and central equipment contracts ever let has been awarded to the Dean Electric Company, Elyria, Ohio, by the Detroit Home Telephone Company, Detroit, Michigan. This contract calls for the manufacture and installation of a complete exchange equipment for the main, east, west and north exchange, besides 8,000 telephones in the initial order.

The main exchange is to consist of 27 sections common battery multiple. A board equipped with 8,000 lines, multiple line and relay equipment, 9,600 answering jacks, besides seven trunking sections, chief operator's desk, four-position observation desk, four-position monitor's desk, three-position wire chief's and a two-position manager's desk. Main and intermediate cords connecting relay racks, duplicate charging machines, duplicate sets storage battery.

East exchange equipped for 1,300 lines, incoming trunk sections, chief operator's, monitor's and wire chief's desks, main and intermediate relay racks, duplicate charging machines and duplicate sets storage battery.

West exchange equipped for 800 local lines, three incoming trunk sections fully equipped, chief operator's, monitor's and wire chief's desks, main and intermediate relay rack, duplicate charging machines, duplicate sets storage battery.

North exchange equipped for 2,400 lines, three incoming trunk sections, chief operator's, monitor's and wire chief's desks, main and intermediate relay racks, duplicate charging machines and duplicate sets storage battery.

All the switchboards include the Dean individual indicating four party ringing keys and wired complete for the Dean harmonic selective party line system, metal lamp jacks and spring metal lamp caps. Each position will be provided with test cords and keys for testing lines and supervisory relays and cords. In addition to the above contracts the following have also been received by the Dean company: Common battery multiple, Canton, N. Y.;, Odessa, Mo.; Moorefield, Ohio; Benzonia, Mich.; Culpepper, Va.; Carbondale, Pa.; Mentor, Ohio; Charleston, W. Va.; Urbana, Ill.; Portland, Ore.

CATCHY TELEPHONE ADVERTISING.

On this page is illustrated a new and catchy idea for telephone advertising. It is especially adapted to the purposes of Independent exchange managers. Those who want to keep their "lamps trimmed and burning" in such a manner that every pay station customer may readily locate the nearest station will find these globes admirably suited for the purpose. They keep the shield conspicuous even after night and should be employed wherever possible.

Solar Illuminated Telephone Sign.

As will be noted from the illustration, these globes are

very broad, and thus afford a surface of considerable area, on which the Independent sign is attractively displayed.

The lamps are attachable to any ordinary electric socket. They are manufactured exclusively by the Solar Electric Company, 163 South Canal street, Chicago, who invite inquiries from the trade. Quite a number of the larger Independent telephone companies of the country already have ordered large quantities of these lamps.

GALVANIZING TELEPHONE CONSTRUCTION MATERIAL.

The Cleveland Galvanizing Works, whose advertisement appears elsewhere in TELEPHONY, has been operating a custom galvanizing shop continuously for over twenty years, at the present time having the largest exclusive job shop west of New York. Although new in the telephone field, this concern has a complete equipment of tools and presses for the manufacture of the reguar standard outside construction material, or special galvanized work of any kind. It has been doing more or less of this work during the past ten years for a limited number of customers, but the demands of the trade have been such that it recently established a separate department for the handling of this line and is now in an excellent position to take care of anything in the way of galvanized angles, galvanized cross arm braces, shims, cable hangers and three pole clamps; also a complete line of machine bolts, carriage bolts and lag screws. The Cleveland Galvanizing Works has a national reputation for the quality of its galvanizing, and guarantees all of its work to stand the American Telephone and Telegraph Company or government tests. It also has a gray iron foundry in connection, which it runs exclusively for furnishing galvanized castings in any quantity. Complete equipment and facilities under one roof enable this concern to make prices which will be of interest to the telephone field in general, and it solicits inquiries from the trade.

INSURANCE FOR TELEPHONE COMPANIES.

It is gratifying to know that some move has been definitely started to give electrical people a co-operative system of insurance of their own at a much lower rate than they are now paying. For some time the various electrical interests have been trying to devise a form of insurance by which they might be able to reduce the cost of their insurance or carry it themselves. Not being able to obtain a low rate, commensurate with the risk, central station and telephone exchange owners are preparing to write their own insurance as Electrical Reciprocal Underwriters, upon the co-operative plan, such as the hardware, lumbermen's, implement dealers, milling and many other kinds of mutual insurance, which have been successfully operated for a number of years.

That co-operation is essential in all lines of trade is becoming more evident each year. In fact, all lines of business and trade have organized state and national associations for reciprocal benefit and protection. That this is a fact is especially evident among the electrical interests, with such organizations as the National Electric Light Association, the International Independent Telephone Association, and many other associations of the allied industries, and especially in insurance, where co-operation means that all subscribers are paying for their insurance at the same rate. It is more difficult to make an equitable rate on different lines than on one business. Over insurance or under insurance, on account of the human limitations of the fire rate, will effect one less in reciprocal insurance than in any other.

The Electrical Reciprocal Underwriters have an office, at which insurance is written on electrical properties only. They have no agents and are intent upon the plan of furnishing insurance to subscribers at actual cost. Patronage is solicited on the ground that it is cheaper insurance than any other and is absolutely fair and just, made so by doing a careful and conservative business and having eliminated entirely any feature of uncertainty. It is well understood by electrical people that their properties are rated excessively high by old-line insurance companies, although the properties are no more liable to loss by fire, when protected and installed in accordance with the present code of the National Board of Fire Underwriters, than are other risks insured at a much lower rate. Ample provision, it is said, is made for the insured to collect his insurance, and he is therefore just as safe, it is claimed, as in any company, and is not paying for a number of unnecessary expenses. It is devised as far as possible upon the plan of one man owning a number of plants and carrying his own insurance by setting aside a small insurance fund at each plant. The total insurance carried by the different inter-insurance organizations, along this line is said to be at present more than $2,250,000,000. The total yearly income, from premiums alone, is about $18,000,000. The total dividend returned annually to subscribers or underwriters is about 80 per cent of the premium, or about $14,400,000. It is evident, therefore, that electrical properties should be enabled to carry their own insurance at a handsome saving to themselves.

No electrical man can manage his business in an up-to-date manner without carrying good insurance on his properties. It is just as much an asset as modern machinery and appliances, and is credit that is duly regarded by manufacturer and jobber.

Electrical people will doubtless be quick to recognize this opportunity for economy, where, before, they were paying excessive rates for moderate protection.

OHIO DISTRICT MEETINGS

The district meetings of the Ohio Independent Telephone Association were held during the month of October as follows:

District No. 1.—E. G. Miller, vice-president, Warren, Ohio, held its meeting October 16 at Cleveland, Ohio. Counties represented—Erie, Lorain, Cuyahoga, Huron, Medina, Lake, Geauga, Ashtabula and Trumbull.

District No. 8.—R. E. Hamblin, vice-president, Toledo, Ohio, held its meeting October 17 at Toledo, Ohio. Counties represented—Williams, Fulton, Lucas, Ottawa, Sandusky, Seneca, Wood, Henry and Defiance.

District No. 7.—G. H. Metheany, vice-president, Lima, Ohio, held its meeting October 18 at Lima, Ohio. Counties represented—Marion, Wyandot, Hancock, Putnam, Paulding, Van Wert, Mercer, Allen, Auglaize and Hardin.

District No. 9.—Dwight E. Sapp, vice-president, Mt. Vernon, Ohio, held its meeting October 23 at Mansfield, Ohio. Counties represented—Crawford, Richland, Ashland, Wayne, Holmes, Morrow, Knox, Union, Delaware, Licking, Franklin, Fairfield, Hocking.

District No. 5.—W. Gilbert Thompson, vice-president, Hamilton, Ohio, held its meeting October 25 at Dayton, Ohio. Counties represented—Butler, Warren, Hamilton, Clermont, Brown and Preble.

District No. 6.—I. H. Thedeck, vice-president, Sidney, Ohio, held its meeting October 25 at Dayton, Ohio. Counties represented—Green, Montgomery, Cark, Champaign, Logan, Shelby, Darke, Miami and Madison.

District No. 4.—H. P. Folsom, vice-president, Circleville, Ohio, held its meeting October 26 at Portsmouth, Ohio. Counties represented—Pickaway, Fayette, Vinton, Jackson, Scioto, Lawrence, Pike, Adams, Highland, Clinton and Ross.

District No. 3.—J. B. Rhodes, vice-president, Zanesville, Ohio, held its meeting October 30 at Zanesville, Ohio. Counties represented—Coshocton, Muskingum, Guernsey, Belmont, Noble, Monroe, Morgan, Washington, Perry, Athens, Meigs and Gallia.

District No. 2.—W. F. Laubach, vice-president, Akron, Ohio, held its meeting October 31, at Canton, Ohio. Counties represented—Summit, Portage, Mahoning, Stark, Columbiana, Carroll, Jefferson, Harrison and Tuscarawas.

EIGHTH OHIO DISTRICT MEETING.

The Independent telephone companies comprising the eighth district of the Ohio Independent Telephone Association, met at the Boody House, Toledo, Ohio, on October 17, 1906.

All the counties in the district were represented. In addition to some thirty-five or forty members of the eighth district, there were present the following gentlemen: J. A. Harney, assistant secretary International Independent Telephone Association; F. L. Beam, president the Ohio Independent Telephone Association: Ralph Reamer, secretary the Ohio Independent Telephone association; E. B. Fisher, president Michigan Independent Telephone Association; C. E. Tarte, manager Citizens' Telephone Company, Grand Rapids, Mich.; C. Y. McVey, general manager United States and Cuyahoga Telephone Companies, Cleveland; H. B. McMeal, editor of TELEPHONY; James S. Brailey, Jr., president of the Cuyahoga, United States and Toledo Home Telephone Companies.

The meeting was called to order at 1:30 p. m. R. E. Hambling, vice-president of the district, acted as chairman, and Floyd N. Dull acted as secretary.

The secretary called the roll of counties, for the purpose of securing information necessary to compile a comparative statement of the Independent and Bell exchanges, telephones, toll stations, number of stockholders, etc., in each county and in the entire district. Owing to a misunderstanding on the part of the various county committeemen this report could not be correctly compiled, and was therefore set aside to be compiled at a later date.

Addresses were made by Messrs. Beam, Fisher, Reamer, Brailey, Tarte, McVey, McMeal and others, along general Independent telephone lines, in the matter of financial and physical growth, the importance of district, state and international Independent telephone meetings, the matter of toll and long distance connections, and the value in an educational way of the Latzke book, "A Fight With an Octopus," being published by TELEPHONY, Chicago. Its general distribution was urged by Messrs. Brailey, Harney, Beam, McMeal and others.

VIRGINIA CONVENTION.

The Virginia State Independent Telephone Association was organized at Manchester, Va., on October 11, with thirty companies represented. The meeting began at 10 o'clock.

Secretary-Treasurer B. L. Fisher, of Rocky Mount, made the following announcement regarding the meeting and the proceedings:

"At a meeting of Independent telephone companies' the organization of the Virginia State Independent Telephone Association was perfected. Independent companies from all parts of the state were represented, and this work on their part is looked upon as one of the most important events in the history of Independent telephony in the state, as it will be the means of bringing the companies into closer touch with each other, and a general betterment of the service in all sections. The association will be affiliated with the International Independent Telephone Association, which comprises about 75 per cent of all the independent companies in the United States and Canada."

The morning session was called to order at 10:30 by H. E. Bradley, of Philadelphia, Pa., secretary of the Pennsylvania State Association, acting as representative of the International association, who made a short speech, outlining the objects of the association and its policy. Committees on credentials, permanent organization and constitutions were appointed, after which the meeting adjourned for lunch.

The afternoon session began at 2:30, when the reports of committees were presented and a permanent organization was perfected.

The following officers were elected for the ensuing year: President, Albert Parlett, Bristol; first vice-president, F. F. Marbury, Alexandria; second vice-president, W. N. McAnge, Suffolk.

A constitution was adopted, and the report of the committee on credentials showed that companies, operating over 10,000 telephones, were represented as follows: Capital City Telephone Company, F. F. Marbury, Alexandria; Farmers' Mutual Telephone Company, of Albermarle, T. E. Powers; Southern States Telephone Company, G. L. Haydn, Norfolk; Bristol Telephone Company, Albert Parlett, Bristol; West Halifax Telephone Company, Mr. Ingram; Franklin County Telephone Company, B. L. Fisher, Rocky Mount; Shuckatuck Telephone Company, George W. Watts, Suffolk; Harrisburg Mutual Telephone Company, W. C. Switzer, Harrisonburg; Nansemond Telephone Company, W. N. McAnge, Suffolk; Rockingham Mutual Telephone Company, W. C. Switzer, Harrisonburg; Floyd County Telephone Company, B. L. Fisher, Floyd Courthouse.

OFFICIAL BULLETIN NO. 4.

In its official Bulletin Number 4 (second series) the International Telephone Association calls attention to the fact that the official report of the last convention's proceedings will be ready for distribution early in November. This report will be verbatim and will hold considerable interest for telephone men. The bulletin calls attention to the fact that the Paul Latzke articles, which ran as a serial in the Success Magazine, have been published in book form under the title "A Fight With an Octopus," and recommends distribution of this book by the Independent companies among the stockholders and subscribers, bankers, brokers and the general public. If distributed in this way it can not fail to help advance the movement by educating the people regarding the true situation in the telephone world. The book is published by TELEPHONY, Chicago.

The bulletin further states: "The Virginia Independent Telephone Association was organized at Richmond on October 11, and will affiliate with the International association. We extend a hearty welcome and best wishes for success to the new organization. The district meetings in Ohio and Indiana are well attended. The movement in both states has made a marked advance during the past six months.

"The executive committee of the association met in Chicago on October 10, and adjourned to meet again on call, without selecting place."

The bulletin calls attention to its map department, and requests telephone men to send in data so that the compilation of maps for all the states may be completed.

THE TELEPHONE TOO FAST.

A recent proposal to construct a telephone line between New York and San Francisco has called forth an interesting criticism, which shows strikingly how modern methods of practically instantaneous communication all round the globe make the sun, in his daily progress, appear as an extremely slow coach. The criticism was that even if the technical difficulties affecting so long a line were overcome, the proposed telephone line would possess very slight importance, because the business hours of San Francisco and New York would coincide for only a few hours each day. It is 1 o'clock afternoon in New York when it is 10 o'clock forenoon in San Francisco.

PROGRESS OF THE MONTH

Compiled by H. A. Downey

NEW COMPANIES

EUREKA, Kan.—The Star Mutual Telephone Company has been incorporated.

EDGEWOOD, Mo.—The Pike County Telephone Company has been organized at this place.

RANDALL, Kan.—The Farmers' Telephone Company has been incorporated with a capital stock of $10,000.

OKARCHE, Okla.—The Mt. Pisgah Telephone Company has been incorporated with a capital stock of $5,000.

ROCHESTER, Ky.—The Rochester Home Telephone Company has been incorporated with a capital stock of $3,000.

LENORA, Kan.—The Lenora Telephone Exchange Company has been incorporated with a capital stock of $2,500.

GRAWN, Mich.—The Farmers' Rural Telephone Company has been incorporated with a capital stock of $5,000.

LA CONNER, Wash.—A new rural telephone line, known as the Beaver Marsh Line, has been organized at this place.

KINZUA, Pa.—The Kinzua and Corydon Telephone Company has been incorporated with a capital stock of $10,000.

HAZEL GREEN, W. Va.—The Progressive Telephone Company has been incorporated with a capital stock of $10,000.

MILBURN, Ky.—The Milburn Independent Telephone Company has been incorporateod with a capital stock of $1,000.

ANNAPOLIS, Md.—The Subscribers' Mutual Telephone Company has been incorporated with a capital stock of $500,000.

CLEO, Okla.—The Cleo Telephone Company has been incorporated with a capital stock of $5,000 by C. R. Williams and others.

IDA, Mich.—The Ida Telephone Company has been incorporated with a capital stock of $5,000 to do business in Michigan and Ohio.

EATON RAPIDS, Mich.—The Onondaga and Eaton Rapids Telephone Company has been incorporated with a capital stock of $3,000.

JAMESTOWN, Ky.—The Jamestown Telephone Company has been incorporated by W. S. Knight, A. D. Wooldridge and W. C. Grider.

WOLFORD, N. D.—The Grass Lake Telephone Company has been organized at Wolford, and will construct a telephone system at that place.

HIGHLAND, Ill.—The Farmers' & Merchants' Telephone Company has been formed at this place for the purpose of installing an exchange.

HOLLAND, Ky.—J. T. Dixon, W. T. Hudson, of Holland, and J. S. Carpenter of Scottsville have incorporated the Holland Telephone Company.

CASHTON, Wis.—The Cashton Telephone Company has been incorporated with a capital stock of $10,000 by Frank E. Steele and Jorgan E. Moen.

LUTHER, Tex.—A telephone company has been organized with a capital stock of $10,000 and exchanges will be installed at Luther and Wellston.

READING, Pa.—The Citizens' Telephone Company of Mt. Pleasant township, Westmoreland county, has been incorporated, with a capital stock of $5,000.

URBANA, Kan.—A rural telephone company has been organized which will connect with the Urbana exchange and with other rural lines in this vicinity.

CORDER, Mo.—The Corder & Aulville Telephone Company has been incorporated with a capital stock of $1,000 by F. W. Brand, J. E. Blase and others.

HIGGINSVILLE, Mo.—The Boland Telephone Company has been incorporated with a capital stock of $3,125 by N. J. Dyer, S. S. McCullough, and others.

HOLDEN, Mo.—The Citizens' Telephone Company has been granted a charter. M. C. Bell is president of the company and J. H. Zehr, secretary-treasurer.

HARMON, Wis.—The Council Bluffs Telephone Company has been incorporated with a capital stock of $450. The incorporators are Frank Olson and others.

PLAINVIEW, Tex.—Articles of incorporation have been filed for the Central Plains Telephone Company with a capital stock of $10,000 by L. Lee Dye and others.

BARBERTON, O.—The Electrical Insulator Manufacturing Company is being formed, with a capital stock of $100,000. The capital will be furnished by Barberton, Akron and Cincinnati people. The company will manufacture high-voltage porcelain insulators and third-rail insulators.

FULTON, N. Y.—The Oswego County Independent Telephone Company has been incorporated with a capital stock of $100,000. The directors of the company are F. A. Gage, Edward Quirk, and J. R. Sullivan, Fulton.

MARATHON, Wis.—The Marathon City Telephone Company has been incorporated, with a capital stock of $1,920. The incorporators are: J. G. Lang and H. B. Stemm.

GOURD, Ky.—The Line Fork-Leatherwood Telephone Company has been organized with $5,000 capital to build telephone lines to Line Fork and Little Leatherwood.

ROCHESTER, O.—Articles of incorporation have been filed for the Merchants' Mutual Telephone Company, with a capital stock of $1,000, by Alexander Rudd and others.

DONIPHAN, Mo.—The Ripley County Farmers' Telephone Company was recently organized at this place with J. F. Klevin, president, and Charles P. Booker, secretary.

BEREA, Ky.—The Berea Telephone Company has been incorporated with a capital stock of $30,000. The incorporators are E. T. Fish, W. H. Porter and M. H. Claggett.

HARTFORD, S. D.—The Sunrise Telephone Company has been incorporated with a capital stock of $5,000 by J. P. Frederickson, William J. Forney, and Clarence Forman.

MARSHFIELD, Ore.—A new telephone company has been organized in this place. Prominent citizens are behind the project and a line will be constructed from Marshfield to Gardiner.

ROCK, Ill.—The Simpson Mutual Telephone Company has been incorporated with a capital stock of $5,000. The incorporators are. John H. Harper, Milo Austin and N. A. Martin.

NELSON, Minn.—The Nelson Telephone Company has been incorporated with a capital stock of $10.000 by John Nelson, C. F. Schelin, N. O. Johnson, H. J. Ernster and J. P. Larson.

ARAPAHO, Okla.—The Valley View Mutual Telephone Company has been incorporated with a capital stock of $800. The incorporators are G. H. Korth, George J. Smart, and E. J. Murphy.

HARMON, Ill.—The Green River Telephone Company has been incorporated with a capital stock of $2.000. The incorporators of the company are Elmer Cotton, C. F. Ribordy, C. F. Brooks.

URICH, Mo.—The Urich Telephone Company has been incorporated with a capital stock of $15,000. Among the incorporators are D. B. Halcomb, J. S. Blough, S. D. Wilson, G. G. Grimes, and others.

AGNES, Tex.—The Agnes Union Telephone Company, which operates rural and toll lines throughout the northern part of Parker county, has been incorporated with an authorized capital stock of $30,000.

MILWAUKEE, Wis.—The Norton-Manitowoc Telephone Company of Norton, Manitowoc county, has been incorporated with a capital stock of $2,000 by Henry Tenrick, Ernst Rodewald and John Grossuesch.

SUMMIT CITY, Mich.—The Farmers' Mutual Telephone Company has been organized at this place with the following officers: President, L. J. Tedman; secretary, Calvin Sparling; treasurer, Moses Bowerman.

FISHER, Ill.—The Fisher Telephone Company has been incorporated with a capital stock of $5.000. The incorporators of the company are William H. Swayze, George W. Robinett, Joseph K. Waddington.

NEW YORK, N. Y.—The Zanzibar Telephone Company has been incorporated with a capital stock of $5,000 to do a telephone business in East Africa. The incorporators are W. D. Despard, F. W. Vining, New York.

BUXTON, Ia.—An Independent telephone company has been organized in this vicinity. It is the purpose to construct a line to Beacon, where connection will be made with the Oskaloosa Home Telephone Company.

MOGREFIELD, O.—The Farmers' Mutual Telephone Company has been organized by Clarence Cotton, Scott Danner, John W. Riley, and others for the purpose of installing a telephone system, with main office at this place.

PRAIRIE GROVE, Ark.—Articles of incorporation have been filed with the secretary of state for the Prairie Grove Telephone Company, with a capital stock of $6,000, all subscribed. The company proposes to install and operate a telephone sytem in the city of

Prairie Grove. The officers and incorporators are as follows: President, E. C. McCormick; treasurer, W. T. McCormick; secretary, W. M. Collins.

DeKalb, Ill.—Articles of incorporation have been filled with the secretary of state for the Exchange Telephone Company of DeKalb, with a capital stock of $25,000. The incorporators are B. F. Wyman, A. S. Bean and V. A. Glidden.

Antwerp, O.—The Antwerp Telephone Company has been incorporated, with a capital stock of $20,000, of which $2,000 is held in Indiana. The incorporators of the company are: A. J. Vernier, C. McLaughlin, H. T. Murphy.

St. Jacobs, Ill.—The Home Telephone Company of St. Jacobs has been incorporated with a capital stock of $5,000, to operate a telephone exchange. The incorporators of the company are Chris Busse, Frank Virgin, John L. Noll.

Gaines, Pa.—Articles of incorporation have been filed for the Elk Run Telephone Association, with a capital stock of $5,000. It is the purpose of the company to construct and maintain lines through Potter and Tioga counties.

Stockport, O.—The Morgan County Farmers' Telephone Company has been incorporated with a capital stock of $5,000. The incorporators are as follows: C. D. Mosher, V. Nott, Freeman Nott, Alvin Mercer and N. D. Harris.

Hammond, Ill.—The Hammond Mutual Telephone Company has been incorporated with a capital stock of $5,000 to operate a telephone system. The incorporators of the company are Frank P. Smith, S. W. Bandy, and C. A. Hacker.

Harvey Station, N. B.—The Harvey Station Telephone Company has been organized with Walter Purce of Coburn secretary. A line will be constructed from Harvey Station to York Mills, under the direction of James Hunter of St. John.

Highland, Wis.—The Pompas Pillar Telephone Company has been incorporated with a capital stock of $352. The incorporators are Chris Blabaum, William A. Carr, N. P. Schwingle, H. W. Schwingle, Andrew Draves and Joseph Pink.

Frankfort, Ky.—Articles of incorporation have been filed for the Monroe Fraternal Telephone Company with a capital stock of $250. The incorporators of the company are as follows: Will Webb, W. J. Gunn, of Mud Lick, and others.

Brock, Neb.—The Brock Federated Telephone Company has been incorporated with a capital stock of $5,000. The board of directors consist of the following: J. W. Carlisle, W. A. Lare, Benton Aldrich, R. T. Hawley and Karl Aldrich.

York, N. D.—The York and Knox Farmers' Telephone Company has been incorporated with a capital stock of $2.000. The incorporators of the company are as follows: L. O. Oleson, H. A. Jones, Nelson Jagnes, R. L. Jones, E. J. Hector, York, N. D.

Pierre, S. D.—Articles of incorporation have been filed for the Pleasant View Telephone Company, a rural line in Lincoln township, Lincoln county. The company is capitalized at $1,200 and the incorporators are Homer Denure, J. F. Hunt, and Otto Johnson.

Valley Springs, S. D.—Articles of incorporation have been filed for the Beaver Bend Telephone Company with a capital stock of $1,000. The incorporators of the company are as follows: J. H. Johnson, Ferdinand Larson, H. C. McGilvery, August Anderson.

Fargo, Okla.—The Fargo-Harmon Telephone Company has been organized and the following officers elected: President, G. W. Bailey; secretary, C. E. Casteller; treasurer, Dr. Hill; business manager, C. A. Stromberg. The company is capitalized at $1,000.

Emporia, Va.—The Emporia Telephone and Telegraph Company has been incorporated with a maximum capital stock of $25,000. The officers of the company are as follows: President, W. Samuel Godwin; secretary and treasurer, H. Schwartz, both of Emporia.

Langford, Man.—The Union Farmers' Telephone Company has been incorporated with a capital stock of $2.000. The incorporators of the company are as follows: W. G. Pollock, J. C. Drysdale, R. Hunter, W. Brydon, J. Dark, D. McLaren, J. McLaren, Langford.

New Weston, O.—The New Weston and Rosebury Telephone Company has been incorporated, with a capital stock of $20,000. The incorporators of the company are as follows: W. W. Busby, Charles Medford, Charles Haher, E. C. Richardson, and J. A. Ainsworth.

Brantford, Ont.—A charter has been granted to the American Machine Telephone Company, Limited, of Brantford, with a capital stock of $450,000. The incorporators of the company are as follows: H. N. Baker, A. E. Knox, T. E. Moulden, of Toronto, and others.

Center City, Minn.—Articles of incorporation have been filed for the Chisago Mutual Telephone Company with a capital stock of $10,000. The incorporators are A. B. Slattengren, Charles Andrews, Center City; F. A. Porter, Franconia; Adolph Anderson, Shafer.

Augusta, Me.—The Santo Domingo Gold and Copper Company has been organized in this city for the purpose of conducting a mining, transportation, telephone and telegraph business, with a capital stock of $64,000. I. L. Fairbanks of this city is president and treasurer.

Jasper, Ala.—The Home Telephone Company of Walker County has been incorporated with a capital stock of $5,000. The officers of the company are: President, E. M. Cranford; vice presidents, J. N. Odom and William Gurganus; secretary and treasurer, John A. Coleman.

Chicago, Ill.—The Corwin Telephone Manufacturing Company has been incorporated with a capital stock of $4,000 for the purpose of manufacturing and dealing in electrical supplies. The incorporators of the company are Fred L. Meckel, Frank Gloidt and Elmer R. Corwin.

Madison, Wis.—Articles of incorporation have been filed for the Beef River Valley Telephone Company of Sumner, Trempealeau county. The capital stock of the company is $2,000 and the incorporators are John Ring, M. C. Johnson, Tom Lomsdal, P. L. Johnson, A. A. Myhre.

Los Angeles, Calif.—Articles of incorporation have been filed for the Northwestern Long Distance Telephone Company, with a capital stock of $1,500,000, and the following officers have been elected: Pesident, Charles E. Sumner, Portland, Oreg.; secretary, Charles C. Porter, Los Angeles.

Bushnell, Fla.—At a meeting recently held at Sumterville it was decided to incorporate an Independent telephone company, to be known as the Tropical Telephone Company. The principal place of business will be Bushnell and lines will be built connecting all towns in Sumter county.

Frankfort, Ky.—Articles of incorporation have been filed with the secretary of state by the Mintonville Telephone Company of Casey county. The capital stock is $540 and the incorporators of the company are as follows: Tyler Jasper, J. C. Jasper, W. T. Hines, and A. D. Taylor.

Minneapolis, Minn.—The Seiple Sectional Pole Company of Minneapolis has been incorporated with a capital stock of $140,000 by Henry M. Seiple and Oliver M. Seiple. The purpose of the organization is to import and manufacture iron telephone and telegraph poles made in sections.

Bono, Ark.—Farmers in the vicinity of Bono have organized a mutual telephone company and have elected the following officers: President, W. B. Broom; vice-president, R. Stichham; secretary, P. R. Barnes. The line will be constructed at once and the main office will be located at Bono.

Augusta, Me.—The Jackson Clock Telephone Company has been incorporated with a capital stock of $1,000,000 for the purpose of manufacturing electric appliances. The officers of the company are as follows: President, H. Lougee of Boston, Mass.; treasurer, J. G. Robinson, Melrose, Mass.

Little Rock, Ark.—Articles of incorporation have been filed with the secretary of state by the Sulphur Rock Telephone Company showing a capital stock of $2,000. The incorporators are W. B. Knight, J. K. Rawlings, W. R. Rice, J. C. McGill, Sam Tuggle, John M. Wood, and Sidney Pickens.

Cortland, Neb.—The Cortland Telephone Company has filed articles of incorporation with a capital stock of $2.240, divided into sixty shares of $35 each. The incorporators of the company are Harry Tweedy, Dr. E. E. Adkes, J. F. Bunte, J. A. Johnston, William Rohe, Henry Pothast and B. Deming.

New Lexington, O.—The Sunday Creek Telephone Company has been organized by a number of Cleveland men for the purpose of building an exchange at New Lexington and other points in the Hocking and Sunday Creek valleys. It will have the long distance service of the United States Telephone Company.

Hopewell, O.—The Indian Camp Telephone Company has been incorporated with a capital stock of $3,000 by W. T. Craig, Thomas McMullen, W. N. Neilley, C. Tremble, J. C. Rankin. It is the purpose of the company to construct, acquire and maintain telephone lines throughout Guernsey and adjoining counties.

Waxahachie, Tex.—The Farmers' Telephone Company has been incorporated with a capital stock of $3,000 for the purpose of constructing a telephone line in Ellis, Dallas, Kaufman, Hill Navarro, Johnson and Tarrant counties. The incorporators are: J. D. Nelson, W. A. Culbertson, G. S. Keesee and G. A. Butcher.

Big Timber, Mont.—The Dry Creek Telephone Company has been incorporated with a capital stock of $10,000 to construct a telephone line from Big Timber to Grey Cliff. The incorporators of the company are as follows: F. M. Loup, L. C. Olmstead and J. T. Est of Big Timber and T. V. Overhuls of Grey Cliff.

Haverhill, O.—Articles of incorporation have been filed for the Haverhill Telephone Company with a capital stock of $2,500. The incorporators of the new company are O. F. Irish, A. S. Goddard, W. A. Brush, H. F. Massie and Henry Folsom. It is the purpose of the company to install a telephone system in Haverhill and vicinity.

Blountsville, Ala.—The Blountsville Home Telephone Company has been organized with a capital stock of $3,000. The officers of

the company are as follows: President, A. F. Baines; vice president, J. D. Small; secretary, R. B. Sims; treasurer, F. B. Wilhite. It is the purpose of the company to install a local plant and also a line from Blountsville to Garden City.

INDIAN FIELDS, N. Y.—Incorporation papers have been filed with the secretary of state for the Indian Fields Telephone Company. The incorporators of the company are as follows: Philip H. Whitbeck, W. D. B. Lester, Charles R. Whitbeck, A. C. Koonz, George E. Dickinson, A. D. Caldwell, Daniel Snyder, Wheelock Udell, of Indian Fields; R. K. Houck, of Keefer's Corners.

CLEARFIELD, Pa.—The Clearfield, Cambria and Indiana Telephone Company has been incorporated with a capital stock of $5,000. John H. Patchen of Patchinsville is treasurer of the company. It is the purpose of the company to conduct a general telephone business in the counties named in the title, with principal exchanges at Clearfield, Johnstown and Indiana, the county seats.

CAIRO, Ill.—The Cairo and Thebes Telephone Company has been organized, with the following officers: President, W. W. Wilbour; vice-president, Albert Brawn; secretary, John S. Norman; treasurer, C. C. Miller. A board of directors consisting of nine members was also elected. Four thousand dollars of the five thousand required to carry out the project have been subscribed.

ESTANCIA, N. Mex.—The Estancia Rural Telephone Company has been incorporated by J. G. Keen and H. C. Keen and construction will begin at once. It is the intention of the incorporators to furnish this place with a complete telephone system and thereafter the line will be extended to other points in the Estancia Valley, connecting all the towns of the county with the county seat.

GALENA, Mo.—The Galena Mutual Telephone Association has been organized with the following officers: President, L. K. Moeller; vice president, J. F. Pinson; secretary, O. T. White; treasurer, J. Shoman. The officers are among the most prominent business men of this place. Articles of incorporation will be filed in the near future and as soon as these are obtained application will be made to the city council for a franchise.

TRAER, Ia.—The farmers of Bruce township, Benton county, and Geneseo township, Tama county, are organizing a farmers' telephone company, the preliminary steps for the organization of the company having been taken. The promoters are well-to-do farmers and a considerable amount of money will be put into the company. It is stated that the company will ask the council of La Porte city for a franchise to enter that city.

WASHINGTON, D. C.—A certificate of incorporation has been filed with the recorder of deeds by the Waynesburg, Jefferson and Carmichael Telephone Company, the stated purpose of which is to construct lines in all parts of the world. The incorporators of the company are as follows: Lorenzo G. Warfield, J. B. Rohrer and F. L. Ward of the District, and T. B. Lee and W. H. Bailey of Pittsburg, Pa. The capital stock is $1,000,000.

BURKEVILLE, Tex.—The Western Union Telephone Company has been incorporated, with a capital stock of $20,000. It is the purpose of the company to purchase, construct, maintain and operate telephone lines in the counties of Newton, Jasper, Sabine, Shelby, San Augustine, Orange, Jefferson, Hardin, Nacogdoches, Angeline and Tyler. The incorporators of the company are as follows: E. F. Montgomery, R. D. Cain, J. F. Smith and others.

GUEYDAN, La.—An enthusiastic meeting of farmers and business men was held in this place recently for the purpose of forming an Independent telephone company. It was decided to organize a $5,000 stock company, to be called the Farmers' Mutual Telephone Company, Limited, for the purpose of building a line to Lake Arthur, Shell Beach, Klondike and other points. A large share of stock was subscribed and everything points to the success of the undertaking.

RUSSELLVILLE, Ky.—The Russellville Home Telephone Company has been organized with a capital stock of $50,000. The officers of the company are as follows: President, Judge Gaines Cooksey; vice president, J. E. Zeluff; secretary, H. H. Smith; treasurer, S. J. Rose. The company will install several exchanges in the vicinity of Russellville. The lines will connect with the lines of the Independent Long Distance Telephone and Telegraph Company, which are already in operation.

HOUSTON, Tex.—Papers of incorporation have been filed for the Southern Telegraph and Telephone Company, with a capital stock of $100,000. The headquarters of the new company will be Houston. The directors of the company are George W. Burkitt, Louis J. Barnes, J. M. Reagan, Edward Kennedy and A. S. Fisher. It will be a long-distance line throughout the southern portion of the state, with local exchanges at Richmond, Rosenberg, Wharton, Victoria, Yoakum, and other places.

ANNAPOLIS, Md.—A company is being formed to be known as the Subscribers' Mutual Telephone Company, with a capital stock of $500,000. Among those interested in the organization are J. Lefferts Conard of Trenton, N. J., president; James C. White, Baltimore, secretary-treasurer; Thomas E. Weems, New York; James W. Owens, Annapolis. The new company will be incorporated under the laws of Maryland. The incorporators are preparing a deed of trust in order to secure an issue of $1,000,000 5 per cent bonds.

ASHEVILLE, N. C.—A certificate of incorporation has been issued for the Union National Telephone Association of Western North Carolina, with principal offices in Asheville. It is the purpose of the company to do business in the counties of western North Carolina. The authorized capital stock is $380, with privilege to increase to $5,000. The incorporators of the company are A. I. Judy, C. A. Holcombe, H. R. Judy, and W. O. Holcombe of Asheville, and C. H. Washburn of Goodhope, W. Va.

BELFAST, Pa.—At a meeting recently held at this place the North Hamton County Pomona Grange organized an Independent telephone company, to be known as the Patrons' Rural Telephone Company, and chose the following directors: D. M. Weber, Hellertown; M. O. Reagle, Mt. Bethel; Albert De Pugh, Martin's Ferry; A. F. Renner, Nazareth; Herbert Shock, Wind Gap. It is the intention of the company to construct a number of rural lines in various parts of the country.

SALT LAKE CITY, Utah.—Articles of incorporation will soon be filed for a new Independent telephone company to operate in southern Utah, which will eventually include every town in that part of the state and will have long distance connection with the Utah Independent Telephone Company of this city. A franchise to operate in Juab county has been secured. Franchises will be applied for in Sappete and Sevier counties. Mr. C. O. Harris of this city is interested in the project and is one of the organizers.

SARANAC LAKE, N. Y.—The Mountain Home Telephone Company of Saranac Lake has been incorporated to operate in the counties of Franklin, Clinton, St. Lawrence, Jefferson, Lewis, Hamilton and Essex. The capital stock of the company is $150,000 and the directors are as follows: Howard Hendrickson, William O. Hendrickson, Henry M. Keys, Frank E. Griffin, William B. Harris, Henry J. Prince, William B. Harris, Henry J. Prince, Jr., Frank E. Derr, of Albany, all of whom are connected with the Independent telephone interests of the state.

WEBSTER CITY, Ia.—The Martin Telephone Company has incorporated with a capital stock of $200,000 and articles of incorporation have been filed with the county recorder. The company specifies in the articles that it will do a general telephone business and also has the power to establish and conduct telegraph and electric light lines. It will do business in Webster City and elsewhere. The capital stock is $200,000, divided into 4,000 shares at $50 per share. The shares are fully paid and non-assessable. The articles were filed by E. H. Martin and M. M. Martin, representing the company.

KEYSER, W. Va.—The Mineral County Division of the West Virginia Mutual Telephone Association has been organized at this place with the following officers: President, J. W. Karskadon; secretary and treasurer, J. W. Wagoner, who, with S. M. Arnold, J. E. Sheets, S. L. Twigg, H. L. Welch, A. W. Bane, W. W. Kessner, and J. W. Vandiver, constitute the board of directors. The company will operate a line from Keyser to Petersburg, where it will connect with the Mutual telephone systems of Pendleton and Hardy counties. By branch lines connections will be had with Hampshire county and east into adjoinng counties of Virginia and West Virginia.

COLUMBUS, Ill.—Articles of incorporation have been filed for the Western Union Telephone Company, with headquarters at this place. The capital stock of the company is $900 and the incorporators are as follows: C. Slade, J. P. Deege, Alvin Koch, J. A. Martin, John H. Longlett, W. Lierly, E. B. Richards, Nathan Lytle, Elmer Bowman, Clarence Bowman, Henry Schuele, C. E. Tilton, L. L. Callahan, E. A. Ehlers, W. C. Muder, J. W. McClintock, Mrs. Elizabeth Koch, E. K. Grubb, W. C. Heckermann, W. C. Longlett, M. N. Rosch, G. J. Tilton, P. J. Deege, Jesse Hunsaker, Bert Allen, W. B. Lierle, Steve Reid, J. S. Buttz, C. M. Henry and H. E. Schmiedeskamp.

ACKLEY, Ia.—Articles of incorporation have been filed for the Home Telephone Company of Ackley, with a capitalization of $15,000. The following officers have been elected: President, C. C. Dawson, of Des Moines; vice-president, John Bleeker, of Ackley; secreary and treasurer, A. T. Whittle, of Waterloo; manager, W. J. Stanton, of Waterloo. The new company has applied to the city for a special franchise permitting the laying of underground conduits, etc., and expects to begin business immediately following the granting of such franchise. The company expects to put in a modern cable plant, with new apparatus throughout, and will endeavor ultimately to reach every town in Hardin county with Independent lines.

LIVINGSTON, Mont.—At a meeting held recently the Livingston Home Telephone Company was incorporated. It is strictly a home company, the incorporators being J. S. Haley, Alex. Livingston, J. M. Seaman, Dr. P. D. Alton, W. B. Dolenty, Dan Allen and W. McGee. H. J. Miller is counselor for the company. The new company will install a plant, modern and up-to-date in every respect, with a capacity for 1,000 telephones, and expects to start with at least 500 telephones in operation. It is expected that the plant will be in operation within sixty days and connection will eventually

be had with every town in the state. Mr. J. S. Haley, formerly of Independence, Mo., will personally superintend the construction of the plant.

ELECTIONS AND MEETINGS

HYANNIS, Mass.—The Cape Cod Telephone Company has elected the following officers: President, F. P. Goss; treasurer, A. E. Guyer.

NEW ALBANY, Pa.—At the annual meeting of the New Albany Telephone Company A. J. Bird was elected president and Ray S. Wilson general manager.

WINFIELD, Kans., R. F. D. 3.—The directors of the Fairview Telephone Company recently elected the following officers: President, Z. B. Myer; treasurer, Z. T. Whitson; secretary, Odis Cann.

BREESE, Ill.—At a recent meeting the People's Telephone Company elected the following directors: Dr. W. G. Bechtold, William Hofsomer, Dr. J. A. Bauer, Fred Rudolph, O. Taphorn, B. H. Donne, and B. J. Lager.

GRAND RAPIDS, Mich.—The Citizens' Telephone Company has elected the following directors: C. F. Rood, E. B. Fisher, Philip Graham, Lester J. Rindge, Gaius W. Perkins, Robert D. Graham, Elbridge G. Studley and Joseph B. Ware.

NEW BEDFORD, Ill.—The Mutual Telephone Company of Bureau county recently held its annual meeting in this place and elected the following directors: Dr. S. E. Williams, E. S. Swanson and W. C. Riley. Dr. Williams is president of the company.

NEBO, Ill.—The Farmers' Telephone Company held its annual meeting at this place and elected the following officers: President, H. T. Shaw; vice-president, Jeff Booth; secretary, R. K. Robinson; assistant secretary, Geo. Filkill; treasurer, Chas. Bowerman.

ANADARKO, Okla.—The Anadarko and Apache Telephone Company has elected the following officers: President, Mr. Cox; vice-president, W. W. McElheing; secretary, R. M. Pell; treasurer, W. F. Leazenby; trustees, J. S. Harper, John Allison, W. Groseclose.

BEDFORD, Ind.—At a meeting of the stockholders of the Bedford Home Telephone Company the old board of directors was elected as follows: President, E. B. Thornton; vice-president, W. N. Mathews; secretary, Charles W. Long; treasurer, W. A. Brown.

QUINCY, Ill.—The Quincy Home Telephone Company has elected the following officers: President, J. R. Pearce; secretary, Frank J. Penick; directors, David Stern, J. H. Bastert, W. T. Duker, David Reidinger, J. R, Pearce, E. Best, Fred Wilms, and Frank J. Penick.

YOLO, Cal.—The stockholders of the Yolo and Blacks Telephone Company held a meeting in this place and elected the following officers: President, W. W. Vickroy; secretary, Lindsay Morris; treasurer, B. Borach; directors, the above officers and C. Hatcher, E. L. Pockman and H. C. Howard.

OSCEOLA, Ark.—At the recent annual meeting of the Tri-State Telephone and Telegraph Company at this place the following officers were elected for the coming year: President, W. J. Driver; vice-president, C. H. Gaylor, Sr.; secretary, S. S. Semmes; manager and treasurer, R. C. Rose.

GREENVILLE, Tex.—At a recent meeting of district No. 2 of the North East Texas Independent Telephone Association held in this city the following officers were elected: President, E. M. Chamberlain, Greenville; vice-president, G. M. Daniel, of Lone Oak; secretary-treasurer, E. Graham, Paris.

ATKINSON, Ill.—The Henry County Telephone Company held its annual meeting in this place recently and the following officers were elected: President, Paul D. Ransom; vice-president, H. A. Martin; secretary, M. M. Everett; treasurer, J. F. Nowers; directors, Seth Moon, Elijah Story, Henry Bumphrey.

PLYMOUTH, Ind.—Independent telephone managers for the first district recently held a meeting in this place. The following counties are comprised in this district: Elkhart, St. Joseph, Laporte, Porter, Lake, Kosciusko, Marshall, Fulton, and Starke. The purpose of the meeting was to improve the service and especially the toll business.

BUTLER, Pa.—At the annual meeting of the stockholders of the People's Telephone Company a large number of improvements were determined upon. Reports showed the net earnings of the past year to have been about $8,000. The following directors were elected: A. L. Reiler, Thomas J. Shufflin, J. V. Ritts, M. Henshaw and J. H. Troutman.

LOS ANGELES, Cal.—At the annual meeting of the stockholders of the Home Telephone Company, held recently, A. B. Cass was elected president to succeed Mr. Mabie, resigned, and W. C. Patterson, vice-president. The company will spend $1,000,000 the coming year in installing a complete automatic system in Los Angeles and building two new stations.

ISHPEMING, Mich.—At a meeting of the stockholders of the Marquette County Telephone Company a new board of directors was elected as follows: J. E. Sherman and D. W. Powell, Marquette; Alexander Maitland, E. C. Anthony and J. H. Winter, Negaunee; M. M. Duncan, H. O. Young, A. B. Miner, Ishpeming; and D. T. Morgan, Republic.

COOPERSTOWN, N. Y.—At the annual meeting of the Otsego Home Telephone Company the following officers were elected: President, Geo. P. Fuller, Rochester; vice-president, H. P. McDonough, Cooperstown; secretary, John A. Losee, Richfield Springs; treasurer, Roy McCanne, Rochester; directors, T. Harvey Ferris, H. A. Harrison, Utica, and Fred Zoller, Rochester.

LYNNVILLE, Ia.—The annual meeting of the Lynnville Mutual Telephone Company was recently held in this place, and the old officers were re-elected as follows: President, C. O. Macy; vice-president, W. F. Zimmerman; secretary and treasurer, E. S. Forsyth; directors, Albert Johnson, S. H. Potter, C. H. Newby. Reports showed the company to be in a very satisfactory condition.

COLUMBIA CITY, Ind.—The Whitley County Farmers' Mutual Telephone Company has elected the following officers: President, Albert Bush; vice president, Melvin Blain; second vice president, Charles W. Alexander; secretary, William H. Carter; treasurer, Charles R. Banks; directors, Albert Bush, Charles Banks, Everett E. Rindfuz, Jesse Miller, Sherman Hively, Charles W. Alexander, Lewis Plummer, William H. Carter, Melvin Blain.

ST. JOSEPH, Ill.—The stockholders of the St. Joseph Telephone Company held their annual meeting in this city recently and elected the following directors: J. J. Woodin, A. B. Glascock, N. C. Hoyt, T. J. Woodin, J. B. Henderson, O. C. Boggs, U. G. Glascock, Dr. William Rees, and C. W. Dale. The directors elected officers as follows: President, T. J. Woodin; vice president, N. C. Hoyt; secretary, J. D. Henderson; treasurer, U. G. Glascock.

DIXON, Ia.—The German Mutual Telephone Company, operating lines from Grand Mound in Clinton county to Walcott in Scott county, held its annual meeting in this city recently and re-elected the old officers for the coming year as follows: President, Charles Paustian; vice-president, John Greve; secretary, Peter Blunk; treasurer, Gustav Alf; directors, Henry Steffen and Charles Porth. The company was reported to be in excellent condition.

VAN WERT, Ia.—The Van Wert Rural Telephone Company has elected the following officers: President, I. N. Skidmore; vice-president, M. P. Garber; treasurer, E. O. Stearnes; secretary, W. H. Ransom; directors, Wilbur Howell, Charles Keller, Grant Spencer, J. Downey, George Barr. The company has under consideration the construction of a line to Osceola and the installation of a new switchboard to meet the demands of its increasing business.

MORRISON, Ill.—The annual meeting of the Whiteside Farmers' Mutual Telephone Company was held in this city recently. The by-laws of the association were revised and it was decided to generally improve the company's lines and service wherever possible. The following officers were elected for the ensuing year: President, Charles Mason, Fenton; vice-president, H. L. Ewing, Lyndon; secretary, C. E. Johnson, Morrison; treasurer, Robert Cochran, Morrison.

DEKALB, Ill.—The People's Telephone Company, recently organized at this place, has elected the following officers: President, B. F. Wyman, Sycamore; vice-president, A. S. Bean, Waterman; secretary and treasurer, C. M. Campbell, Genoa; directors, B. W. Lyons, Waterman; V. A. Glidden, DeKalb; Robert Renwick, Mayfield; Franklin Hall, Sycamore; Arthur Dodge, Malta; C. M. Davis, Esmond; Charles Sward, Hinckley; George Dicks, Mayfield; I. Vanderberg, Kingston.

JOPLIN, Mo.—The annual meeting of the stockholders of the Home Telephone Company was held in this city recently, and considerable business was transacted relative to the future development of the property. The election of a board of directors resulted in the selection of the following: Breckenridge Jones, St. Louis; R. E. Frye, Carthage; Theodore Gary, Macon; W. H. Warren, Joplin; A. F. Adams, Joplin. The retiring members of the board are John W. Layne and H. E. Scovern of Joplin.

LAFAYETTE, Ind.—The stockholders of the Lafayette Telephone Company held their annual business meeting recently and elected the following directors: William Folckemer, William Horn, O. P. Friberg, George P. Haywood, William S. Baugh, Leopold Dryfus, Edgar A. Taylor, Dr. Edgar V. Burt and Thomas Duncan. The election of the directors was followed by a meeting of that body for the purpose of organization and the following officers elected: President, William Folckemer; vice-president, William Horn; secretary, O. P. Friberg; treasurer, William S. Baugh; attorney, George P. Haywood.

ABERDEEN, S. D.—The Dakota Central Telephone Company has elected the following officers for the ensuing year: President, J. W. Zeitlow; vice-president, Charles N. Herried; secretary-treasurer, W. G. Bickelhaupt; superintendent, J. F. Zeitlow. The company has about 5,000 miles of pole lines upon which are strung about 12,000 telephone circuits. Fully one-half of this mileage is of copper metallic; one-fourth is of iron metallic, and the remainder iron grounded circuits. The company has eighty-four exchanges and employs 500 persons. Its lines extend into North Dakota and Minnesota and touch Nebraska and will eventually invade the Black Hills. The company was organized originally by Mr. J. W.

Zeitlow in 1883 under the name of the Dakota Emner Telephone Company.

ALLENTOWN, Pa.—A meeting of the reorganization committee of the Inter-State Telephone Company of New Jersey, which some time ago purchased the property of the company at foreclosure sale, was held recently. The following directors were named: W. S. Hancock, H. R. Swartz of Trenton, N. J., Robert E. Wright and Charles West of Allentown, A. J. Bakewell of New York, John Markle of Jeddo and George M. Relchard of Wilkesbarre. The property of the company consists of a system covering Trenton, Atlantic City, Elizabeth, Paterson, Passaic and thirty other towns in New Jersey. It is the intention of the new company to develop the property.

SPRINGFIELD, Mass.—The annual meeting of the Heath Telephone Company, headquarters Shelburne Falls, was held recently. Reports showed the total receipts for the year to be $23,674; expenditures $23,489. A 6 per cent dividend called for $2,204; for new construction there was paid out $14,437, and for maintenance and repairs, $6,848. The by-laws were amended to increase the number of directors from five to seven and W. A. Barber of Leyden and Seth B. Crafts of Whately were added to the directorate. There are now 853 telephones in service. The officers of the company are as follows: President, W. E. Kinsman, of Heath; clerk and treasurer, Herbert Newell, of Shelburne Falls; directors, W. E. Kinsman, D. G. Tyler, of Jacksonville, Vt.; G. E. Davis, of Shelburne Falls; F. L. Trotter, of Conway; Herbert Newell, W. A. Barber, of Leyden; S. B. Crafts, of Whately.

ORDINANCES AND FRANCHISES

JAMESTOWN, N. D.—A. B. Cox has been granted a telephone franchise in this city.

MACKINAW, Ill.—Mackinaw has granted the Mutual Telephone Company a twenty-five year franchise.

OROFINO, Idaho.—A franchise has been granted to the Clearwater Telephone Company to operate its system in this city.

LAWTON, Okla.—F. A. Miller, G. M. English, and others have applied for a franchise to establish a telephone system in this place.

VALLEY CITY, N. D.—The C. O. Wheeler Telephone Company has applied to the city council of Valley City for a telephone franchise.

JAMESTOWN, N. D.—The Independent telephone company has made application for a thirty-year franchise to do a toll business in Jamestown.

UPLAND, Cal.—The telephone franchise recently advertised for sale by the city trustees has been awarded to C. T. McCulloch of Upland for $750.

BECKLEY, W. Va.—The Wyoming Telephone and Development Company has secured a franchise to construct a telephone service within the county.

CHEHALIS, Wash.—The Home Telephone Company has applied to the county commissioners for a franchise to use all the county roads in extending its system.

PITTSFIELD, Ill.—The Home Telephone Company of Quincy has made application for a franchise to extend its system into Pittsfield and other parts of Pike County.

BAUDETTE, Minn.—The town of Baudette has granted a franchise for ten years to Sam B. McNamara for the purpose of maintaining and operating a telephone system.

LIBERTY, Mo.—The city council has granted a franchise to the Clay County Telephone Company. This company has a telephone service extending over the entire county.

OMAHA, Neb.—The Home Telephone Company, now known as the Gate City Telephone Company, has agreed to accept a thirty-five-year franchise from the city of Omaha.

SALT LAKE CITY, Utah.—The Utah Independent Telephone Company has secured a fifty-year franchise for the construction and maintenance of a telephone system in Alpine.

NEPHI, Utah.—Alma C. Hyde of Nephi has applied for a telephone franchise. A company will be incorporated and it is expected work on the system will begin in the near future.

BEHLER, W. Va.—A franchise has been granted to the Behler-Hagans Telephone Company to construct a telephone line over the county roads in Clay, Cass and Grant districts.

ALBION, Mich.—The council has granted a twenty-year franchise to the Homer Telephone Company of Homer. Work on the toll line connection between Albion and Homer will begin at once.

CHESTERTON, Ind.—The Portage Home Telephone Company is seeking to enter the city of Valparaiso. This company is composed of Porter county farmers and now has about 400 telephones in service.

OMAHA, Neb.—The mayor has signed the Independent telephone ordinance recently passed by the city council and the proposition of granting an Independent telephone franchise to the Heim-Parmelee-Pollock syndicate will be submitted to the vote of the people at the November election.

OMAHA, Neb.—The city council at a recent meeting passed an ordinance providing for the presentation of the Heim-Pollock-Parmele telephone franchise to the voters at the November election.

QUEBEC, Can.—The Bellechasse Telephone Company has been granted a franchise to enter the city of Quebec, upon conditions to be determined by the company and the city, but no exemption from taxes will be granted.

EATON, O.—The Morning Sun Telephone Company, which was recently refused a franchise by the council of the village of Camden, has filed a petition in the local probate court asking that tribunal to determine the matter.

WHEATLAND, Calif.—F. W. Anderson will apply to the supervisors of Marysville for a telephone franchise. Mr. Anderson has recently acquired the Independent telephone line extending from Wheatland to near Marysville.

LOMPOC, Cal.—The Home Telephone Company has made application for a franchise in this city. The city attorney has been authorized to prepare an ordinance for the franchise and the city clerk instructed to advertise for bids.

BERKELEY, Cal.—The town trustees have instructed Attorney Harry H. Johnson to draw up a new franchise for the Home Telephone Company, which, if the company agrees to the terms of the board, will be awarded to the company.

HUNTINGTON, Ind.—It is stated that the New Long Distance Telephone Company has asked for a franchise for a plant at this place, principally for long-distance service, but it is intimated that a city exchange will eventually be built.

CHARLESTON, Ill.—The People's Mutual Telephone Company is petitioning for a franchise to operate in this city. It is also stated that a company of local capitalists will ask for a franchise to construct and operate a telephone system here

LINDSAY, Ont.—The town council has passed a by-law granting a 21-year franchise to the Canadian Machine Telephone Company, of Toronto, which has an automatic telephone system installed in Peterboro, and one in course of installation in Brantford.

NEWTON, Ill.—The city council has granted to E. J. Clapp, the present owner of the local telephone plant, a twenty year franchise with the privilege of installing telephones on both the metallic and grounded system. Mr. Clapp will at once make improvements in the plant.

MITCHELL, S. D.—After nearly two years of waiting the Missouri Valley Telephone Company has at last, by direction of the court, been given the right to do business in this city. The matter has been in the courts for the past year and a half and Judge Smith has just rendered a decision in favor of the company.

NEW BADEN, Ill.—At a meeting of the village board the Citizens' Telephone and Telegraph Company was granted a franchise to maintain its telephone system within New Baden. The Looking-glass Prairie Company also applied for a franchise, but its petition was denied, as it refused to connect with the Citizens' company.

PORTLAND, Ore.—The *Oregonia* is authority for the statement that the franchise for the Northwest Long Distance Telephone Company, which is the Home Telephone Company of Portland, is pending before the Milwaukee council. The ordinance is for a franchise for 25 years. The franchise is in the hands of the council committee.

RENTON, Wash.—The Citizens' Telephone Company, which has been operating a line through the Rainier Valley, will ask for a franchise to enter Renton. The company has constructed its lines to the city limits and will enter the city immediately upon the franchise being granted. A switchboard was recently installed at the Columbia City exchange, with a capacity of 3,500 telephones.

FARGO, N. D.—The North Dakota Independent Telephone Company has made the following proposition to the ordinance committee of the city council: That they would pay to the city of Fargo for a twelve-year franchise to operate and maintain a long-distance telephone exchange, the sum of $5,000, or in lieu thereof, at the option of the council, a 2 per cent gross earnings tax on all business originating in the city of Fargo, said franchise to be granted not later than November 5, 1906.

RUTLAND, Vt.—The board of aldermen recently granted the Home Telephone Company of Albany, N. Y., a franchise to locate and operate a plant in this city. It is the concern's first franchise in Vermont, but application will be made for franchises in other cities at once. The franchise was granted to W. H. Baldwin of this city and Irving H. Griswold, of Elyria, O. An application for a charter to start a stock company will be made at the opening of the legislature and if it is granted a company will be organized immediately, to which the franchise will be assigned.

WINNIPEG, Man.—Ben Allen has made application for the right to construct and operate a telephone and telegraph system in Winnipeg. One of the provisions of the agreement which Mr. Allen placed before the fire, water and light committee gives the city the

right to purchase the entire plant in 10, 15 or 20 years, another provides that one per cent of the dividends declared shall be paid over to the city annually, while a third gives the maximum rates which the company agrees to charge for the telephone service. Mr. Allen states the company when formed would give a bond of $5,000 or $10,000 as the city might require, to guard against delays in construction and operation. It is the plan to have long-distance lines through all the western provinces and local systems in each town and city.

STAMFORD, Conn.—An application has been filed with the common council by the State Line Telephone Company for permsision to construct subways in the principal streets of Stamford and to conduct business in this city. The petition was accompanied by a communication from Vice President D. A. Reynolds, in which he expresses the belief that the laws which enable the Southern New England company to monopolize the telephone business in the state are unconstitutional. He states that his company is prepared to test the validity of the legislation before the United States Supreme Court, but that in order to bring a suit the company must secure an entrance into the state. The company has chosen Stamford as a basis for operation. The proposition has been referred to the finance committee of the common council for investigation, with instructions to confer with the corporation counsel for advice as to the legal phases of the proposal.

NEW CONSTRUCTION

CAIRO, Ill.—The Cairo Telephone Company has under consideration the erection of a new exchange building.

GRAFTON, N. D.—The Grafton telephone exchange is to be rebuilt, work on the same to begin about February 1.

LANSFORD, N. D.—The Northern Telephone Company contemplates the installation of a new exchange at this place.

FAIRVIEW, Ky.—The Home Telephone Company of Hopkinsville will in the near future install an exchange in this place.

MT. PLEASANT, Ia.—The Mt. Pleasant Telephone Company will rebuild a part of its system and make other improvements.

CONVERSE, Ind.—It is stated that negotiations are pending for the consolidation of the two telephone companies at this place.

LANCASTER, Minn.—The Kittson Telephone Company contemplates installing an automatic telephone exchange in Lancaster.

WILMINGTON, Dela.—It is the intention of the Westchester, Wilmington and Kennett trolley line to install a telephone system.

MARSHALL, Mich.—The Citizens' Telephone Company contem plates the construction of a new exchange building at this place.

MEMPHIS, Tenn.—It is proposed to build a telephone line along the levee from Memphis to Walnut Bend. Mr. N. H. Pharr is the engineer in charge of the work.

MERIDA, Yucatan, C. A.—There is a project on foot for the construction of a new telephone line throughout the city and to connect with the port of Progreso.

EVANSTON, Wyo.—A company is being organized here to construct a telephone line at a cost of $5,000 from Kemmerer to Big Piney, a distance of seventy-five miles.

MORTON, Ill.—The Tazewell County Telephone Company will be compelled to cable all its wires in Morton that cross the interurban tracks, which will be quite an expense to the company.

WILSON, N. C.—The Carolina Telephone & Telegraph Company will install a new central energy telephone system at a cost of $25,000. A new franchise has been obtained from the city.

MEXIA, Tex.—It is stated that Weir Bros. & Weir of Winsboro are preparing to install an exchange at this place. These gentlemen were among the first to enter the Independent field in Texas.

CAMBRIDGE CITY, Ind.—The Citizens' Telephone Company will construct an additional line between Richmond and Cambridge City in order to take care of the greatly increased business of the company.

HOUSTON, Tex.—Permission has been granted to the Texas Telephone Company by the county commissioners to construct a private telephone line between Houston and Humble. Work will begin at once.

JENA, La.—A telephone exchange will be installed at this place. O. E. White is at the head of the enterprise. A proposition will be made to the Winnfield exchange of Winnfield, to extend a long distance line from that place to Jena.

TREMONT, Ill.—The Tremont Independent Telephone Company is making arrangements to construct new lines in Tremont and will also build additional county lines. The company has recently installed a new switchboard and office equipment.

COLDWATER, Mich.—The Southern Michigan Telephone Company has begun the installation of a complete telephone system, which will cost at least $85,000, and which will include a new exchange building and new equipment throughout. All wires will be placed underground in the business section of the city. The plant will have a capacity of 1,100 subscribers in the city and 1,200 rural subscribers.

ITHACA, N. Y.—The Ithaca Telephone Company will install 20,000 feet of aerial cable and expects to lay 12,000 feet of underground cable. The switchboard capacity has recently been increased to about 4,000 and everything possible will be done to make the system thoroughly up to date.

SANTA ANA, Cal.—The Home Telephone & Telegraph Company will soon begin the construction of a system of telephone lines covering Orange county from Tustin on the south to the county line on the north. In the near future a switchboard will be installed at this place with double the capacity of the present one.

BUTTE, Mont.—The Montana Independent Telephone Company has purchased a site and will erect a new exchange building in the not far distant future. The immediate installation of cables and pole lines will be in excess of the present needs of the city, and the capacity of the conduit system will be in excess of 15,000 subscribers.

LEAVENWORTH, Kan.—The contract for the erection of the People's Home Telephone Company's new plant at Sixth and Delaware streets was awarded to R. B. Yoakum by Frank Parker and A. B. Conklin, secretary and treasurer of the company respectively. Mr. Yoakum's bid was $14,000. Work on the building will begin at once.

SUPERIOR, Wis.—The Douglas County Telephone Company has purchased a site and will at once commence the erection of a home of its own. The building will probably not be ready for occupancy before spring. During the winter months new switchboards and other machinery necessary in the completion of the exchange will be installed.

LUBBOCK, Tex.—The Staked Plain Telephone Company, with headquarters at this place, has just completed a metallic line from Lubbock to Big Springs and will install an exchange at Tahoka in the near future. This is an entirely new system but recently inaugurated and it is fast covering the counties of Lubbock, Lynn, Borden, Terry, Hockly and Crosby. C. W. Alexander is president of the company and Geo. Curtis, manager.

BARDSTOWN, Ky.—A committee of citizens has been soliciting for stock subscriptions to the Independent Telephone Company, which will shortly be installed in this county. Quite a large amount of capital is back of the new organization, and as soon as the streets are cleared of the Cumberland Telephone Company's poles and wires immediate steps will be taken toward the construction of the new line. It is proposed to extend the system to all points in the county.

CHAMPAIGN, Ill.—The Home Telephone Company announces that it will install an automatic telephone system within the next few months. This work has been under consideration for the past year, but the company has been unable to make the necessary arrangements for financing the project until this time. The company will install a plant which will be as good as any in the state. Work on the improvements will be started at once and will be pushed as rapidly as possible.

ROCKWELL CITY, Ia.—The Central Telephone Company has purchased two business blocks and will erect a building exclusively for the use of the Rockwell City exchange and the main offices of the company for all its territory. The building will be as nearly fireproof as it is possible to make it and planned for model offices for telephone purposes. In connection with these improvements the company is planning to put all its wires on the main leads over the town underground, thus doing away with the many poles and wires along the streets.

UNDERGROUND CONSTRUCTION

ELGIN, Ill.—The Interstate Telephone Company will place a portion of its wires underground in this city.

BENTON HARBOR, Mich.—The Twin City Telephone Company is asking from the city the right to put its wires underground in the downtown districts, at a cost to exceed $40,000. The matter has been referred to Mayor Morrow, City Attorney Bridgman, and the street and alley committee. Captain John Robinson and W. A. Preston appeared before the council as representatives of the telephone company and urged the immediate granting of the right, declaring they were determined to give the city better service as soon as possible and it was desired to commence work on the new system without delay. To complete the conduit plans will take over nine months.

LAFAYETTE, Ind.—Extensive underground work which will result in nearly all telephone wires being removed from the business district of the city will be undertaken within the next few weeks by the Lafayette Telephone Company. The sum of $18,000 is to be expended for conduits in which to place the wires now overhead. The company has purchased a site and will install a new model, up to date exchange. More than $100,000 will be expended in improvements. A trust has been formed for voting and for better and more efficient management. The trust is to run ten years and the trus-

tees elected are as follows: William Folckemer, Dr. E. V. Burt, and O. P. Friberg. The company is in a prosperous condition, the number of telephones having grown from 300 to 3,000 in eight years.

COMBINATIONS

MACOMB, Ill.—The interests of the Grange Telephone Company and the Western Telephone Company have been consolidated and the lines of both exchanges will be operated from one switchboard.

MAYFIELD, Ky.—A deal has just been completed between the Home Telephone Company of this place and the Planters' Independent Telephone Company of Marshall and Calloway counties which will place the Home company in connection with 800 more people and will be of great value to the Home subscribers.
Edina telephone plant.

ST. JOHN, N. B.—A meeting of the shareholders of the Central Telephone Company held recently authorized the directors to amalgamate with the New Brunswick Telephone Company, of which Hon. A. G. Blair is president. The charter of the latter is to be used and the shareholders of the Central are to get an equivalent in the New Brunswick's stock at par.

REORGANIZATIONS

SPRINGFIELD, Tenn.—The Springfield Home Telephone Company has been reorganized with the following officers: President, H. C. Stratton, Jr.; vice-president, John McMurray; secretary, A. L. Dorsey; treasurer, J. C. Monteith. The company has recently completed improvements and extensions, remodeling its plant throughout.

EXTENSIONS AND IMPROVEMENTS

ROCK HILL, Tenn.—The Rock Hill Telephone Company, Paul Workman president, will improve and extend its system.

DILLON, Mont.—The Southern Montana Telephone Company has voted to make numerous extensions in the Big Hole Basin.

NEW HAVEN, Ind.—Plans are being made to further extend the lines of the Home Telephone Company around New Haven.

GLENDALE, O.—In order to take care of its increased business the Glendale Telephone Company will install a new switchboard.

TAYLORVILLE, Ill.—The Christian County Telephone Company contemplates improvements to cost in the neighborhood of $5,000.

CHESTERTON, Ind.—The Northern Indiana Independent Telephone Company will install a new switchboard in the near future.

BOLTON, Conn.—The directors of the Bolton and Coventry Telephone Association are considering the advisability of extending its lines.

IOWA CITY, Ia.—The Johnson County Telephone Company is planning many improvements for the betterment of its system in this city.

CYNTHIANA, Ky.—The Cynthiana Telephone Company will expend $18,000 in the next few months perfecting its plant and building new lines.

CRESTON, Ind.—The Northwestern Telephone Company has completed exchanges at Lowell and St. John's and is now planning several extensions to its system.

COLUMBIA CITY, Ind.—The Whitley County Farmers' Mutual Telephone Company contemplates the expenditure of $5,000 in improvements and expenditures.

IMLAY, Mich.—T. F. Holden & Co. have taken charge of the local telephone company. An effort will be made to extend the service throughout the township.

GUTTENBURG, Ia.—The Standard Telephone Company, with headquarters at Waukon, will rebuild its line between this place and Clayton Center, work to begin at once.

HALIFAX, N. S.—The Nova Scotia Telephone Company has decided to make a number of improvements in the Eastern Telephone Company's system lately purchased by it.

COOPERSBURG, Pa.—The directors of the Coopersburg Rural Telephone Company are considering the extension of its lines to connect with the Franklin company's lines at Springfield.

ROCK HILL, S. C.—Preparations are being made for extensive improvements in the local telephone system. A new and improved switchboard will be installed and much cable work done.

LOUDONVILLE, O.—Owing to the greatly increased business of the Star Telephone Company it will be necessary for the company to install a new exchange at this place, which it is estimataed will cost in the neighborhood of $10,000.

BARBERTON, O.—Over $2,000 is to be expended by the Akron People's Telephone Company in repairing the Barberton branch. New toll and new transfer boards will be installed, and other repairs for the betterment of the service will be made. A farmers' party board will also be installed. The repairs will be completed by the time the new automatic exchange in Akron is ready for operation.

VANCOUVER, Wash.—The Ridgefield, Sara and Vancouver Farmers' Union Telephone Company, which has recently completed a trunk line extending from Vancouver to Ridgefield, Felida and Sara, is planning to extend its lines to Pioneer and La Center.

NORWALK, O.—The Local Telephone Company will install a new cable in a portion of the city, which, together with the other improvements being made, will cost from $5,000 to $6,000. During the past year the company has increased the number of its subscribers from 600 to 960. W. W. Libhart is manager of the company.

ABERDEEN, S. D.—At the annual meeting of the Central Telephone Company, held in this city, action was taken by the company in the appropriation of $250,000 in extending its system over the state, which will include an additional 450 miles of wire. New lines will be built out of Aberdeen. The company proposes to remodel its exchange buildings at Mitchell, Watertown and Huron.

NORWALK, O.—At a meeting of the directors of the Bellevue Home Telephone Company, recently held in this city, reports submitted showed the company to be in a very prosperous condition and the improvements and extensions which have been contemplated will be carried out. A committee composed of F. E. Knapp, B. F. Bell and Frank L. Beam of Mt. Vernon was appointed to superintend the rebuilding of the Bellevue exchange. It was decided at this meeting to change from aerial to underground construction in the business district of the city and the conduits were ordered to be put down at once. The other work connected with the rebuilding of the exchange will be deferred until January 1.

FINANCIAL NOTES

HOMER, Mich.—The Homer Telephone Company's stock now pays 7 per cent per annum.

BRADFORD, Ill.—The Empire Telephone Company has increased its capital stock from $20,000 to $35,000.

TOLEDO, O.—The Toledo Home Telephone Company has declared the regular 2½ per cent quarterly dividend.

CAPRON, Ill.—The Capron Home Telephone Company has increased its capital stock from $3,000 to $10,000.

MARSEILLES, Ill.—The Marseilles Telephone Company has increased its capital stock from $4,000 to $12,000.

KIRKLAND, Ill.—The Farmers' Union Telephone Company has increased its capital stock from $2,500 to $5,000.

GREENVILLE, Ill.—The Bond County Telephone Company has increased its capital stock from $6,000 to $18,000.

GRAND MANAN, N. B.—The Grand Manan Telephone Company contemplates increasing its capital stock to $7,000.

LAFAYETTE, Ind.—The Lafayette Telephone Company has increased its capital stock from $120,000 to $150,000.

BURLINGTON, Ia.—The Mississipni Valley Telephone Company has increased its capital stock from $25,000 to $50,000.

NEW BEDFORD, Mass.—The Automatic Telephone Company of this city has declared a quarterly dividend of 1½ per cent.

HELENA, Mont.—The Lewiston-Billings Telephone Company has filed notice of increase of stock from $20,000 to $50,000.

HANSKA, Minn.—The board of directors of the Hanska Telephone Company has declared a dividend of 6 per cent.

FESTUS, Mo.—The Festus Telephone Company has filed a statement showing an increase in capital stock from $4,500 to $7,500.

GREEN SPRING, O.—The Green Spring Telephone & Electric Company has increased its capital stock from $35,000 to $40,000.

PRAIRIE HOME, Mo.—The Farmers' Telephone Company of this place has filed a statement increasing its capital stock from $3,000 to $5,000.

PIKEVILLE, Ky.—The Home Telephone Company has increased its capital stock to $12,000 and will extend its line to Georger and Elkhorn City.

SENATH, Mo.—The Senath Telephone Company of Dunklin county has filed a statement showing an increase in its capital stock from $1,500 to $6,000.

TECUMSEH, Nebr.—The first quarterly dividend is being paid on stock of the Johnson County Telephone Company. The dividend amounts to 8 per cent.

BEDFORD, Ind.—By a unanimous vote the Bedford Home Telephone Company agreed to increase the capital stock of the company from $75,000 to $125,000.

MANKATO, Minn.—The Citizens' Telephone Company has declared a semi-annual dividend of three per cent on preferred stock and four per cent on common stock.

COLUMBUS, O.—At a meeting of the board of directors of the Citizens' Telephone Company a quarterly dividend of 1½ per cent was declared on the preferred stock of the company and a quarterly

dividend of 1¼ per cent on the capital stock of the Franklin County Telephone Company.

BOONVILLE, Mo.—The Boonville Telephone Company has increased its capital stock to $50,000 and will make improvements and extend its lines in all directions.

LAFAYETTE, Ind.—O. P. Friburg, secretary of the Lafayette Telephone Company, has filed a notice showing an increase in the preferred stock of the company by $50,000.

NEWARK, O.—The directors of the Newark Telephone Company have declared a 2 per cent quarterly dividend on common stock. Semi-annual dividends are paid on preferred stock.

WHITESBURG, Ky.—The Whitesburg Telephone Company has increased its capital stock to $8,000. It is the purpose of the company to build additional lines. S. H. Fields is general manager of the company.

LAKE FORK, Ill.—The telephone company has increased its capital stock to $12,000. The following directors were elected for the coming year: C. B. Moore, Henry Landis, W. E. Means and Bud Stallsworth.

CLEVELAND, O.—The United States Long Distance Telephone Company has declared a quarterly dividend of 1½ per cent on the preferred stock and a quarterly dividend of 1 per cent on the common stock.

NORWALK, O.—At a meeting of the directors of the Local Telephone Company the regular quarterly dividend of one and one-half per cent was declared. It was decided to hold a stockholders' meeting November 14.

FRANKFORT, Ky.—Amended articles have been filed with the secretary of state by the Beech Creek Telephone Company of Muhlenberg county, proposing to increase the amount of its capital stock from $40,000 to $150,000.

ROCHESTER, N. Y.—At a meeting of the board of directors of the Stromberg-Carlson Telephone Manufacturing Company the regular quarterly dividend of 2½ per cent on the common stock and 1¾ per cent on the preferred stock was declared.

BIG SPRINGS, Tex.—For the purpose of increasing its capital stock from its present capitalization of $60,000 to that of $125,000, the Western Telephone Company of Big Springs, has filed an amendment in the department of the secretary of state.

CLEVELAND, O.—The United States Independent Telephone Company has issued $2,500,000 worth of 6 per cent two-year bonds to replenish the working capital, which has fallen low in consequence of the firm's action in accepting unmarketable bonds in payment of some of its accounts.

HAMILTON, O.—The stockholders of the Home Telephone Company held their annual meeting in this city and among other business, declared a dividend and disposed of $40,000 of stock for more extensive improvements with the object in view of giving better local and long distance service.

ATWOOD, Ill.—The Atwood Telephone Company recently held its annual meeting at this place. Reports showed the company to be out of debt. The capital stock was increased to $12,000. The following board of directors was elected: C. B. Moore, W. E. Means, Henry Landis, J. L. Stallsworth.

MARQUETTE, Mich.—The Marquette Telephone Company operating throughout the county, has voted to increase its capital stock from $60,000 to $100,000. The new capital will be used in improving the system. The company is the sole competitor of the Michigan State Company in the upper peninsula.

COLUMBUS, O.—Notices have been issued of the declaring of a 1 per cent quarterly dividend on the common stock of the Cuyahoga Telephone Company. The board has also declared a quarterly dividend of 1½ per cent on the preferred stock. The dividend on the preferred has been paid semi-annually, but from now on it will be quarterly, payable about 30 days after the end of each quarter.

MANKATO, Minn.—At a meeting of the directors of the Citizens' Telephone Company a large appropriation was made for making cable extensions in Mankato and also for increasing the company's system elsewhere. A committee consisting of Messrs. H. A. Patterson, Judge Lorin Cray, W. D. Willard, Nic Petersen and Dr. Webster, was appointed to consider matters pertaining to the service with farmers in the vicinity of Rapidan.

GRAND RAPIDS, Mich.—At a meeting of the directors of the Citizens' Telephone Company the thirty-seventh consecutive regular dividend of 2 per cent was declared. The directors also decided to construct a copper line from Traverse City to Elk Rapids, a distance of about twenty-five miles, and, in connection with the Swaverly Telephone Company, a copper line from Greensburg to Kalkask, a distance of twenty miles. Work on these lines will begin as soon as possible.

NEW BEDFORD, Mass.—Important changes, including an increase in capital stock and a replacement of the present equipment with new, have been decided upon by the Automatic Telephone Company. The adoption of the new system will relieve the company of the obligation of paying the royalties that are now required and will, it is expected, place the company on an improved financial basis. The capital stock, it is understood, will be increased from $100,000 to either $150,000 or $200,000.

MUSKEGON, Mich.—The Citizens' Telephone Company has increased its capital stock from $50,000 to $100,000, through the issuing of $50,000 of preferred stock. The stock is being offered at par to the holders of the company's common stock. The preferred stock earns dividends at the rate of 6 per cent per annum, payable semi-annually on January 1 and July 1. The company has paid dividends on its common stock since its organization at the rate of 8 per cent a year, payable semi-annually.

Moscow, Idaho—The capital stock of the Interstate Telephone Company is to be increased to $500,000, which will be used in building extensions. M. A. Phelps, president of the company, announces that already 250 miles of line is in operation and that lines will be extended into various parts of Washington, Oregon and Idaho. An exchange will be established in Spokane which will probably be the headquarters for the company. A meeting of the stockholders has been called for November 2, when several plans will be discussed.

COLUMBUS, O.—Directors of the Columbus Citizens' Telephone Company have been considering the advisability of increasing its rates. Officers of the company say that the present rate was based on an exchange of less than 5,000 telephones. Now the company has almost 10,000 telephones and its cost of operation has increased much faster than its receipts. While the franchise of the company limits the price which may be charged for telephones, the decision of the Supreme Court of Ohio in the Toledo telephone case holds that such restrictions in a telephone franchise are invalid.

LOUISVILLE, Ky.—The board of directors at its regular monthly meeting declared a quarterly dividend of 1 per cent. This action places the stock on a regular 4 per cent basis, and means that $52,400 will be distributed among the stockholders in quarterly installments of $13,100. This will be the fourth dividend of the company. The initial dividend, calling for 1½ per cent, was paid July 1, 1905. On January 1, 1906, 2½ per cent was distributed, and in July the dividend was 1½ per cent. The stockholders have ceived 5 per cent on their stock this year.

CLEVELAND, O.—The United States Telephone Company has increased its capital stock from $4.500.000 to $5,000,000, the increase being 6 per cent preferred, redeemable January 1, 1913. Provision was made for this increase at the time the company was reorganized in June, but owing to the work incident to rearranging the affairs of the big merger, application had not been made to the secretary of state for a change in the charter until now. The $500.000 additional capital stock is to be used in the final payment for the companies that have been taken over by the United States Telephone Company.

ROCHESTER, N. Y.—The United States Independent Telephone Company has authorized an issue of $2,500.000 of collateral trust 6 per cent two-year notes and bond. The interest on these notes will be paid semi-annually on the 17th day of March and the 17th day of September, on which date payment or payment in full may be made on said notes by the company upon giving notice as required under the terms of the indenture securing same. The security for these above notes is conservatively estimated at $5,000.000 or twice the amount of notes. This security is deposited with the Rochester Trust and Safe Deposit Company as trustee.

ST. PETER, Minn.—Stockholders of the Cannon Valley Telephone Company at their annual meeting, held at Waterville, voted to increase the capital stock from $50,000 to $100 000. Reports made by the secretary and treasurer showed that $20.000 was expended last year in erecting extensions and double that amount will be needed to construct the new lines now under consideration. The company, which is one of the most prosperous Independent concerns in the state, has exchanges in Waterville, Montgomery, Le Sueur, Center, Elysian and Janesville. The company is erecting a large brick building at Waterville, which will be used for its general offices.

MINNEAPOLIS, Minn.—The Tri-State Telephone Company offers for sale $500,000 of its 6 per cent preferred stock, free of tax. The company pays the state a 3 per cent gross earnings tax on its entire receipts, which frees the stockholders from taxes. The financial statement shows that after paying all expenses, taxes, fixed charges, dividends and interest, and $200,000 for maintenance and depreciation, the company has a net surplus of $150.000, sufficient to pay the dividend on the $500,000 of stock now offered for sale five times over. The company was organized a little over five years ago and in that time it has increased its subscribers from 2.600 to nearly 22,000 and its gross receipts from $30,000 to $900.000. During this time it has never missed a dividend. It has now in St. Paul and Minneapolis stockholders and bondholders owning two millions of its securities. E. H. Moulton of this city is president of the company.

PERSONAL MENTION

HEBRON, Neb.—W. E. Goodhue has been appointed manager of the Hebron Home Telephone Company.

ELGIN, Ill.—William Tisdell has resigned his position as manager of the Interstate Telephone Company, in this city.

POMONA, Kan.—Ernest M. Clark is the promoter of a new telephone system to be operated in Pomona and vicinity.

BENNET, Neb.—Kelsey Whitmer has been appointed to take charge of the Farmers' Mutual Telephone Exchange at this place

ST. JOHN, N. B.—F. A. Hackett has been appointed manager of the New Brunswick Telephone Company, with headquarters at this place.

LAGRANGE, Ky.—George Fisher has been appointed manager of the Oldham Telephone Company to succeed Walter Overstreet, resigned.

CLARION, Ia.—James Bunn, of Webster City, has been appointed manager of the telephone system at this place to succeed F. H. Peterson.

JACKSON, Mich.—John Smith has resigned as manager of the Citizens' Telephone Company at this place and will be succeeded by Frank Kehle.

HART, Mich.—J. K. Flood, secretary and director of the Lake Shore Telephone Company, has resigned and will be succeeded by D. J. Mathews.

SULLIVAN, Ill.—A. O. Harrison of Rantoul, Ill., has been appointed manager of the Sullivan Telephone Company, to succeed J. L. Kirk, resigned.

DOWS, Kan.—F. H. Peterson has purchased a half interest in the Jameson Telephone Exchange at this place and will take charge of the management of the same.

DANVILLE, Ill.—Birch E. Baum of Ridgefarm has been appointed general superintendent of the Vermillion County Telephone Company, with headquarters at this place.

WAXAHACHIE, Tex.—F. S. Eaton of Fort Worth has been appointed manager of the Ellis County Telephone Company at this place, to succeed Cecil Fearis, resigned.

CHICAGO, Ill.—Mr. F. B. Patten, well and favorably known in the telephone field, has accepted a position as general manager of the Rolfe Electric Company of Rochester, N. Y.

CARROLL, Ia.—W. E. McKee, formerly connected with the Montezuma telephone exchange, has been appointed manager of the Carroll County Telephone Company at this place.

EDENTON, N. C.—F. N. Bond has been appointed superintendent of the Edenton Telephone Exchange, which was recently purchased by the Carolina Telephone and Telegraph Company.

DURAND, Mich.—L. L. Conn, manager of the Union Telephone Company at this place, has resigned his position and will go to Alma to fill the position of secretary of the company, succeeding J. H. Fildew.

PORTLAND, Me.—F. E. Ebersole, formerly of Lincoln, Neb., who has assumed the general managership of the telephone system in this city, announces that his first work will be to improve the service and render it the best possible.

LAFAYETTE, Ind.—Frank O. Cuppy has been elected manager of the Lafayette Independent Telephone Company, succeeding O. P. Friburg, who will become secretary of the company. The question of installing automatic telephones was discussed by the directors. It is probable the new system will be installed before many weeks.

INDIANAPOLIS, Ind.—Notice has been filed with the secretary of state showing that Frank Andrews of Woodburn, Allen county, has been appointed the Indiana representative for the Antwerp Telephone Company, an Ohio incorporation, with a capital stock of $20,000. The amount represented in Indiana is stated as being $2,000.

PHILLIPSBURG, Kan.—A. W. Robinson, who has had the management of the local telephone system, has been succeeded by L. A. Champlin of this city. Mr. Robinson still holds the secretaryship in the company, but expects to give that up as soon as he disposes of his interests in the business. The other stockholders have taken most of Mr. Robinson's interests.

JACKSON, Mich.—Charles R. Kehoe, who has been with the Citizens' Telephone Company for the past three years as wire chief, has been appointed manager of the People's Telephone Company of this place to succeed J. C. Smith, resigned. This company, which began business in 1902 with 500 telephones in operation, now has between 2,500 and 3,000 telephones in service, out of which number 1,500 are rural and farm connections.

PIQUA, O.—Mr. A. R. Pollock, manager of the Home Telephone Company, has invented a telephone service meter, and after a thorough test of his invention Mr. Pollock made application to the department of the interior at Washington for a patent. He has decided to put it upon the market and twenty-five instruments are now in course of manufacture in this city. The instrument registers all calls coming into the office and will also register the number of calls in a specified time.

TRANSFERS

CLARKSVILLE, Ark.—The Clarksville Telephone Exchange has been purchased by Penny Frisby at a cost of $4,000.

WINONA, Minn.—The Winona Telephone Company has purchased the Robinson telephone lines near Money Creek.

AMHERST, Va.—R. T. Seay has bought the Amherst Telephone Company and is engaged in giving the system a thorough overhauling.

EVERMAN, Tex.—J. Martin Scott and J. Luther Gantt have purchased from J. W. Hudson the telephone system at this place, the purchase price being $2,000.

MARBLE ROCK, Ia.—David Cates of Waterloo has purchased the Marble Rock telephone exchange and has taken possession of same. The purchase price was $6,000.

PALMYRA, Mo.—The Palmyra Telephone plant, formerly owned by C. A. McComb, has been purchased by Wm. Lind of Hillsboro, Wis., for a consideration of $8,100.

VINTON, Ia.—The Vinton and Benton Telephone Company has been purchased by the Corn Belt Telephone Company. The new owners will make extensive improvements in the system.

MONTROSE, Pa.—The Montrose Telephone Company has been purchased by a party, most of whom are from West Auburn. It is stated the line will be improved and put in the best condition.

MIDDLETOWN, N. Y.—The Orange County Telephone Company has purchased of the Hudson River Telephone Company its line from this city to Howells and the same will be extended to Otisville.

CANYON, Tex.—The Northwest Texas Telephone Company, with headquarters at this place, has sold its entire system, consisting of four exchanges and three or four hundred miles of toll lines, to the Amarillo Telephone Company.

GALESBURG, Ill.—The Galesburg Union Telephone Company, which recently secured a franchise at East Galesburg, has taken over the lines operated formerly from Dahinda and is connecting them with the new exchange in this city.

CENTRAL LAKE, Mich.—The Traverse Bay Telephone Company has purchased of the Michigan State Telephone Company its interests in Bellaire, Central Lake and as far as Eastport. With this addition the company now has over 700 telephones in the county.

MOUNT STERLING, Ky.—The East Kentucky Telephone Company of this city, with lines all over this section of Kentucky, has been sold to the People's Independent Ice and Coal Company of St. Louis, Mo. The new owners will reorganize and rebuild the plant.

ALBION, Ill.—Arch Bassett has secured control of the Wayne County Telephone Company's interest in the Albion exchange. It is the intention of the new owner to place everything in first-class condition and a number of new telephones will be installed at once.

WEST PLAINS, Mo.—Mr. Thos. J. Walton has just recently purchased an interest in the West Plains Telephone Company and will at once assume active control of the system with Mr. Frank Dail, who heretofore has had its sole management. It is the purpose of the new management to increase the efficiency of the system.

GOSHEN, Ind.—The Dunlaps Telephone Company, at Dunlaps, has been absorbed by the Farmers' Mutual Union, the new company, which will take possession November 1st. Negotiations have been pending for some time. The purchase price is said to be in the neighborhood of $8,000. By the combination effected it is expected to have between 300 and 400 telephones in service as soon as the proposed new lines are completed.

COLUMBUS, Ind.—The Grammer Telephone Company has purchased the exchange building and equipment of the Burnsville Telephone Company, and the exchange of the last named company will be removed to Grammer. Both companies are in this county and about 500 telephones are involved. The Burnsville people will be without a telephone exchange and they are now trying to effect arrangements with the Citizens' Telephone Company of this city to establish an exchange there.

SCOTTSBORO, Ala.—The local telephone exchange and its lines, which have been operated as an independent system, have been sold by W. L. Moody to local citizens who propose to incorporate a company with a capital stock of $25,000 and greatly improve and extend the system. The new owners contemplate putting in a copper circuit line from Decatur to Chattanooga in the near future, also to put in exchanges at Stevenson and Bridgeport. The system has been a paying one all along and the new company proposes to increase the dividends by giving a better service and extending the lines. The officers of the new company are as follows: President, Dr. J. O. Lipscomb; secretary, J. W. Gay; treasurer, L. W. Rorex; manager, D. E. Barclal; attorney, Hon. John F. Proctor.

LEGAL ITEMS

CHICAGO, Ill.—The Edison Telephone Company, 226 South Clinton street, Chicago, has been closed on an attachment. The company dealt in second hand telphone apparatus.

GREENFIELD, Ind.—The receiver of the Hannah Jackson Telephone Company has been ordered to dispose of the plant at private sale. Dr. Frank Cregor of Carthage is receiver.

PARSONS, W. Va.—In the case of the Parsons Telephone Company vs. Citizens' United Telephone Company for $2,500, damages for alleged violation of contract, verdict was rendered in favor of the latter.

FRANKFORT, Ky.—In the case of the Frankfort Telephone Company vs. The City of Frankfort, the circuit court has decided that the telephone company could not compel the city to repeal an ordinance which fixes the rate for ten years to be charged for telephones.

WINNIPEG, Man.—An act of legislation passed at the last session of the Dominion parliament forces all telephone companies operating under Dominion charters to give exchanges and furnish all other facilities to any other telephone companies that require them. That is to say, the company with a Dominion charter must merge its system with the system of any other company or companies, operating under provincial or municipal control or simply as independent companies, where such connection is required.

TEXARKANA, Ark.—A condemnation suit has been filed in the Bowie County, Texas, County Court by the Texarkana Independent Long Distance Telephone Company aaginst the Texarkana and Fort Smith Railway to condemn a right of way for the plaintiff's long-distance toll lines on and along the right of way of the defendant railway company between this city and Shreveport. The building of this line will place Texas in direct communication with the Caddo oil fields and will also connect with the Cass county telephone lines recently purchased by the Texarkana Telephone Company.

MUNCIE, Ind.—Judge Leffler in the circuit court entered judgment for the plaintiff in the suit of the North Manchester Telephone Company against the Home Telephone Company of Wabash. Time was granted for a bill of exceptions and the filing of an appeal bond by the defendants, who, through their counsel, Warren G. Sayre of Wabash and James Bingham of this city, gave notice of their purpose to appeal the case. Damages to the amount of $150 were granted the plaintiff and it was also decreed that the injunction stand during the period of the contract which expires in 1916. The attorneys' fees in the case already reach up far into the hundreds of dollars.

NASHVILLE, Tenn.—A special term of Chancery Court has been convened for a hearing of the injunction suit of the Home Telephone & Telegraph Company against the mayor and city council. The injunction grew immediately from the interference of the city authorities with the attempts of the company to erect poles and string wires through the streets. The company was chartered as a long-distance company by the state and by virtue of its charter claimed the right of eminent domain over the city streets. Through the police the city authorities stopped the company's employes in their work, which resulted in the injunction. Several weeks may be consumed in the trial.

DALLAS, Tex.—The North Electric Company has filed an application for a receiver against the Texas Consolidated Long Distance Telephone Company, George W. Riddle, A. J. Brown and the American Exchange National Bank of Texas, the said application alleging that the said Texas Consolidated Telephone Company is indebted to the plaintiff for a certain balance of about $819 said to be due on equipment furnished it by the North Electric Company; that the said telephone company is insolvent, and that the said balance constitutes a prior lien on the assets of the company, which have been mortgaged to secure certain notes held by the said American Exchange National Bank.

TEXARKANA, Ark.—The Texarkana Telephone Company has filed suit in the Miller county circuit court against the Southwestern Telegraph and Telephone Company for alleged statutory penalties aggregating one hundred thousand dollars for failure to comply with the Arkansas law requiring it to permit physical connection with its long-distance wires for the transmission of messages by the plaintiff. The Arkansas statute provides a penalty of $100 per day, payable to the company against whom discriminations are made. The complainant alleges that plaintiff has twice within the last two years filed written demands with defendants for connection with its long-distance wires, but said demands have been refused and ignored. The suit will come up for a hearing in November.

RICHMOND, Ky.—Attorney W. S. Moberly has filed suit against the Richmond Telephone Company for $250 for removing from his office his telephone because he refused to pay the increased rate asked for service embracing connection with the country telephones. This increased rate was lately established and Mr. Moberly contends that as he and all other citizens have been paying the franchise rate, it is unjust to be compelled to submit to an arbitrary raise. Attorney for the company claims that the franchise contemplated service only in the city limits, and that the country service entailed extraordinary expense upon the company and hence it should be compensated by a necessary increase of rates. The result will be watched with interest inasmuch as the principle of arbitrary increase of rates is involved.

MISCELLANEOUS

REDDING, Cal.—A new telephone system is to be installed at this place.

JESUP, Ga.—The telephone exchange at this place was recently destroyed by fire.

REINBECK, Ia.—The United Telephone Company is engaged in installing 5,000 feet of new cable.

WATERVILLE, Minn.—The Canon Valley Telephone Company is extending its lines in all directions.

QUINCY, Ill.—The Quincy Home Telephone Company has increased the number of its directors from five to eleven.

EDMONTON, Alta., Can.—The rate payers of Edmonton recently carried a by-law to raise $65,000 to install a new telephone system.

LUDINGTON, Mich.—The directors of the Lake Shore Telephone Company have chosen Thos. Brownley as manager of the company.

NUMIDIA, Pa.—The new Roaring Creek Valley Telephone Company, with headquarters at this place, is installing a new telephone exchange.

JONESBORO, Ark.—About $30,000 has been subscribed by local people for the telephone system and the company will at once build an exchange.

ASHLAND, Ala.—Dr. Thos. Northen, of Ashland, one of the pioneer telephone men of this section, has recently installed an entirely new outfit.

GADSDEN, Ala.—D. Reich, owner of the Printup Hotel in this city announces that he contemplates remodeling the hotel and will install a telephone system therein.

DENNISON, O.—A petition is being circulated protesting against the removal of the Dennison exchange of the Home Telephone Company and its consolidation with Uhrichsville.

SAN ANTONIO, Tex.—The San Antonio Telephone Company has paid its franchise tax of $581.70, the assessment having been reduced by the city council from $50,000 to $30,000.

WHEELING, W. Va.—The National Telephone Company has let the contract for a $40,000 switchboard to be installed in the central exchange, which will give a capacity of 6,000 telephones.

CLEVELAND, O.—The United States Telephone Company is now connected with over 400 plants and exchanges and reaches 230,000 telephones in Ohio alone. The toll lines aggregate 24,000 miles.

HAMILTON, O.—The directors of the Home Telephone Company have authorized the purchase of over two hundred new telephones which will be used in the extensions which the company is planning.

PROPHETSTOWN, Ill.—The necessary papers have been signed completing the dissolution of the Prophetstown Mutual Telephone Company from the Whiteside Farmers' Mutual Telephone Company.

SPRINGFIELD, Mo.—Work has commenced on the new telephone system to be installed by the Home Telephone Company. The company contemplates an expenditure of $300,000 on its plant in this city.

ABERDEEN, S. D.—There are eleven hundred telephones in service in Aberdeen. Aberdeen has the only automatic plant in South Dakota and is said to have the only party line automatic in the world.

CONWAY, Ark.—The Conway Telephone Company has increased to such an extent as to make it necessary to seek larger quarters and a plan is on foot to purchase a site and construct a new building for its use.

LINCOLN, Neb.—A new Independent telephone line has been opened up connecting Falls City and Humboldt with Lincoln. This line gives Lincoln direct connection with Kansas City over Independent lines.

PLAINVILLE, Conn.—A movement is on foot to establish a telephone exchange in this place, and the interest taken in the effort appears to warrant the belief that one will be inaugurated within a short time.

EMPORIA, Kan.—F. R. Holmes, representing the Kansas City Long Distance Telephone Company of Kansas City, is seeking permission to establish an exchange in this city. The matter has been referred to a committee.

TOKYO, Japan.—It is announced that a graduate of the Tokyo School of Physics has invented and patented a telephone receiver capable of transmitting sound 3,000 miles. He intends to obtain patents in other countries.

RENO, Nev.—It is stated that Richard Kirman, Joseph Short, and C. E. Mack, bankers of large means, are considering the question of forming an Independent telephone company with a view to seeking

franchises throughout this section of the state and probably in eastern California.

KANSAS CITY, Mo.—The Home Telephone Company has paid over to the city $2,662.95 of gross receipts for quarter ending September 30, 1906, as required by the provisions of its franchise on a basis of 2 per cent annually.

LORAIN, O.—The Black River Telephone Company is rapidly making improvements in its equipment by extending its lines and adding new telephones to its list. The demand for some time has been greater than the supply.

JESUP, Ia.—About twenty Independent telephone companies operating in Black Hawk County have organized an association, with E. M. Haradon of this place president and F. Ardecker of Janesville secretary and treasurer.

BYRON, Cal.—A farmers' telephone company is preparing for the construction of a system of rural telephone lines from Byron to Antioch. A large farming district will also be covered, with central offices at Oakley, Knightsen and Brentwood.

DECATUR, Ind.—At the last meeting of the board of directors of the Citizens' Telephone Company reports showed an increase of 162 instruments during the year, making a total of 641 telephones in this city, while at Berne there has been an increase of 90, making a total of 245.

WATERLOO, Ia.—The Corn Belt Telephone Company of this city has completed through long-distance lines from Waterloo to Webster City, Sioux City, Sioux Falls and Council Bluffs, and is now able to furnish long-distance service to these and intermediate points.

QUINCY, Ill.—After the consideration of offers submitted by the Bell Telephone Company and the Independent Home Telephone Company, the Board of Estimate of Quincy has decided in favor of the Independent company, and the latter's system will be installed in the schools.

ST. JOHNSVILLE, N. Y.—The contract for the contemplated extension of the Interstate telephone lines to Crown Creek and Oppenheim has been let to George Reese of Crown Creek, who will begin the work immediately. Other immediate extensions are also contemplated.

MASCOUTAH, Ill.—The Looking Glass Prairie Telephone Company will have its system in operation within a few days. The company will start with about sixty telephones in service, and as soon as the exchange is in operation work will be commenced on the lines in the country.

CHEROKEE, Kan.—D. O. Lane, owner of the Cherokee telephone exchange, having refused to give connection to the mutual telephone lines recently completed to this place from Girard and McCune, citizens of Cherokee are considering the matter of organizing another exchange.

HALLOWAYVILLE, Ill.—A meeting was held in this place recently for the purpose of promoting the Farmers' Mutual Telephone Company in Selby township. This company was started near New Bedford about two years ago and now covers the greater part of north and west Bureau county.

ABILENE, Tex.—The Roberts Telephone & Electric Company is spending thousands of dollars in improving its exchange at this place, which includes 30,000 feet of new cable, new telephones, central energy switchboard, new dynamos, etc. It is also constructing a new exchange building.

RUTLAND, Vt.—The Home Telephone Company of Albany, which was successful in its fight against Mayor Paige, the common council having granted the company a franchise over the mayor's veto, announces that it will petition the state legislature, now in session, for the right to incorporate.

DENISON, Ia.—As the result of a conference held at this place between representatives of the Woodbine Telephone Company and the Crawford County Telephone Company, a copper metallic circuit is to connect the Independent telephone companies of Denison and Woodbine, by way of Dunlap.

CALGARY, Alberta.—The Alberta Government has appointed Jas. Grierson, of Calgary, as superintendent of Construction for the telephone lines it is about to construct. The first line to be built will be one between Calgary and Banff, which it is expected to have completed by the close of the year.

TRAVERSE CITY, Mich.—The farmers on the peninsula have organized a telephone company and have already begun construction work. The whole of the peninsula is included in the territory. The officers of the company are as follows: President, H. E. McGraw; secreary and treasurer, P. F. Lardie.

TORONTO, Ont.—The Century Telephone Construction Company has been authorized to do business in Ontario, as contractors, and to manufacture and sell telephone appliances. The capital to be used in Ontario must not exceed $40,000, and A. F. Wilson, barrister-at-law, Toronto, has been appointed its attorney.

CAYUGA, Ont.—Messrs. Myron A. Gee, of Rainham Centre, and T. Hoover of Selkirk, representatives of the Erie Telephone Company, have been canvassing this place in the interest of the company. Quite a number of subscribers have been secured and a much greater number is anticipated for the near future.

DENVER, Colo.—A bitter fight is being waged between the Colorado Telephone Company and the new Automatic Telephone Company, which is trying to get a franchise from the city November 6 to operate in Denver. The fight is not purely local, but will extend to every city in Colorado, Utah, Wyoming and northern New Mexico.

WASHINGTON, D. C.—The Glasgow municipal telephone undertaking has been sold to the British postoffice authorities at a loss to the corporation of $75,000; that is, the corporation received that much less than it expended. The friends of municipal ownership assert that the citizens were benefited by lower rates than the government will maintain.

UNION CITY, Ind.—It is stated that the Independent telephone companies will make a determined effort to establish an exchange in this city. Although the Independent forces have a toll line into the city, there has been no exchange here in a number of years, the Bell company having a monopoly in this line in town as well as in the country hereabouts.

WILLS POINT, Tex.—The Wills Point Independent Telephone Company has just opened a new exchange at Myrtle Springs. The company is reported to be in a flourishing condition. Mr. E. F. Fink has charge of the system, and although surrounded by Bell lines and lessees, he has been extending the system, building new lines and adding new subscribers.

DECATUR, Ala.—Officers of the Morgan County Telephone Company, an Independent company of the Decaturs, are contemplating connecting their lines in Madison county with another Independent company of Scottsboro. With this connection the Independent company would have connections with all points in the extreme northeastern portion of the state.

GRAND FORKS, N. D.—The Tri-State Telephone Company recently paid the city council the 2 per cent premium pledged as a franchise offset. The earnings of the company as reported from May 31, 1905, to June 1, 1906, aggregated $12,250, and 2 per cent of this was paid to the city council in acordance with the proposition under which the franchise was granted.

BENTON HARBOR, Mich.—The city council has refused the request of the Twin City Telephone Company for an ordinance which would permit the construction of an underground service. The council insisted that if the company would expend from $40,000 to $60,000 on the system as it is the service would be much improved. The company has 1,500 telephones in service.

SOUTH BEND, Ind.—It is stated that the South Bend plant will be equipped entirely with automatic apparatus in place of the part automatic and part manual equipment now in use. The development of the local telephone business of the South Bend company will be pushed energetically with the idea of making South Bend one of the best telephoned cities in Indiana.

RED LODGE, Mont.—At a mass meeting of the citizens called to discuss the war of the labor unions against the Mutual Telephone Company, it was voted as the sense of the meeting that Red Lodge should build and own a municipal telephone system and that until such time as it was constructed the demands of the unions to take out the telephones of the Mutual not be acceded to.

IDA GROVE, Ia.—The Ida County Farmers' Mutual Telephone Company is engaged extensively in construction work, having close to a hundred miles of line under way in the southern portion of Ida county. These are all farmer lines, owned by the users of the telephones, and will connect with the telephone system at Ida Grove, thus giving the farmers an oportunity for long distance connection.

ACKLEY, Ia.—A. T. White of Waterloo and C. Dawson of Des Moines are interested in a new movement to establish a telephone exchange in this place with toll line connections to all points in Butler, Grundy, Franklin and Hardin counties. In the proposed franchise which the city council will be asked to grant the wires of the new company are to be placed under ground. Local parties are also interested in the project.

SHELBYVILLE, Ind.—John W. Coffey, representing the New Long Distance Telephone Company, of Indianapolis, was in the city recently arranging for a toll station for the company. The company will also place telephones in a number of the business rooms of this city. He also stated that there would be an Independent plant established in Shelbyville in the near future, the bulk of the stock of which would be taken by local capitalists.

DES MOINES, Ia.—C. A. Hollis of Hudson, manager of the Farmers' Mutual Telephone Company, is interested in a movement for the organization of an association of mutual and independent telephone lines in this vicinity. The object of the association is to perfect a system whereby the companies can use each other's lines on long-distance talks on a toll-paying basis. Mr. Hollis has just recently succeeded in organizing such an organization among the independent and mutual companies in Black Hawk, Tama, Dela-

ware, Buchanan, Butler, Fayette, Clayton, Chickasaw, Grundy and Floyd counties.

SPOKANE, Wash.—Albert Held, architect, of Spokane, has completed plans for headquarters of the Home Telephone Company in Spokane, to cost $60,000. The structure will be of re-enforced concrete, fireproof, and is to be completed in May, 1907. It will have a frontage of 71 feet with a depth of 100 feet, two stories high and basement. A sub-station to cost $5,000 will also be erected in Spokane. Work will begin in the near future.

PATASKALA, O.—A preliminary meeting of parties interested in the proposed Mutual Telephone Company was recently held in this place. A temporary organization was effected by electing J. O. Pryor chairman and R. Conine secretary. A committee was appointed, consisting of W. H. Montgomery, S. J. Peters and F. B. Headley, to draft by-laws. Another meeting was arranged for the purpose of perfecting a permanent organization.

LEBANON, O.—The Valley Telephone Company, the Lebanon branch of the United States Telephone Company, is effecting many radical changes in its Warren county exchange. New rural lines are being built and the minor exchanges altered. The greatest change, however, is the installation of an entirely new system in this city. When completed there will be a capacity of 800. The improvements will cost in the neighborhood of $10,000.

WABASH, Ind.—The question of installing an automatic telephone system in this city is being considered. A number of the directors and business men of Wabash will be sent on inspection tours to other cities. Inasmuch as the rebuilding of the entire telephone system by the Home company is necessary with its removal to the new building, which is now under course of construction, this would be a most opportune time to install such a system.

SWEDESBORO, N. J.—The latest issue of the directory of the People's Rural Telephone Company shows a remarkable growth. It has always been the aim of this company to give the best service to its rural subscribers and it has received hearty support from the farmers connected with its lines. The growth of the toll business has been particularly rapid. The officers of the company are as follows: President, George W. F. Gaunt; treasurer, Wm. H. Wolf; superintendent, W. K. Sloan.

PORTLAND, Ore.—Service will be established in the business district by the Home Telephone Company by December 1, and the entire system will be in operation January 1. The total number of subscribers enrolled to date exceeds 8,200 and for the past few weeks they have been coming in at the rate of about 500 a week. Long distance lines are being built through the Willamette Valley and between Portland and Tacoma. It is expected connection will also be made with the California Independent long distance system.

LOUISVILLE, Ky.—Several changes in the directorate of the Louisville Home Telephone Company are rumored on account of some of the directors having sold most of their holdings. Two-thirds of the stockholders recently signed a petition to the directors to increase the dividends from 3 per cent to 4 per cent, payable quarterly. The company has been earning 8 per cent, and the stockholders and three or four of the directors who hold from 500 to 1,000 shares thought that, in view of the earnings, a larger dividend should be declared.

DETROIT, Mich.—Contracts have been awarded for the central office switchboards and the substation telephones which are to form the equipment of the Home Telephone Company's new plant to the Dean Electric Company of Elyria, O. The total present capacity of these switchboards is for 15,000 lines and they are designed to have an ultimate capacity of 40,000 lines. Contracts have also been awarded for the underground cables to John A. Roebling's Sons Company of Trenton, N. J., and the Stromberg-Carlson Company of Rochester, N. Y.

OMAHA, Neb.—The Independent Telephone Company has been able to connect its Iowa lines with the Nebraska Independent systems. The towers to support the cable across the river have been completed and the cable placed. Connections are made with the long distance office of the Independent companies in South Omaha and through that switchboard with the Plattsmouth Telephone Company, the Independent organization operating in the South Omaha commercial field. This arrangement will connect up 100,000 telephones in Iowa and Nebraska. The towers carrying the 1,800 feet of aerial line across the river are substantial affairs of steel construction, 120 feet high.

MONTREAL, Can.—A party of Canadian Pacific officials recently made a test of the telegraphone, the new instrument which is to be introduced on a number of railways. The party consisted of D. McNicoll, J. McCormack, James Kent, W. J. Camp, O. W. Pease and J. B. Gaughn, and F. C. Hirsch of the Telegraphone Company. The scheme is one by which telephonic communication with any station can be established on a train by connecting an apparatus with the telegraph wires, and at the same time not in any way interfere with the lines as telegraph lines. A special car with the apparatus on board took the party out near St. Constant, where the train was stopped and the work of connecting the apparatus took only a few seconds, and in one minute members of the party were talking to Montreal and Farnham. It was the general opinion among those present that the invention is a valuable one and that it will be adopted by many railways.

PLYMOUTH, Ind.—At a meeting of representatives of Independent telephone companies in this section, held in this city recently, the following resolution was adopted: "That as our toll line service now practically covers this entire district, and as we have fifty exchanges and 20,000 subscribers, as against seven exchanges and 3,000 subscribers of the Bell, which bluntly refused us connections when we so much needed them, there would be no advantage in now giving the Bell company connections. Therefore we pledge ourselves to refuse connection with the Bell company and will sever all connection with any Independent company in our district which gives such connection."

KEOKUK, Ia.—The Mississippi Valley Telephone Company, which has had under consideration the erection of a central office to cost at least $10,000 or $12,000 and to install therein a modern switchboard which would cost $30,000, and in addition to this to construct underground conduits for the cables throughout all of the business districts, branching out into the more important residence section, is about to abandon its project, due to the fact that the city council demands that the telephone company build, connect and maintain the city's Gamewell system. The company refuses on the ground that it is complying with every feature of the ordinance governing it which was passed three years ago.

ABERDEEN, S. D.—J. L. W. Zeitlow has just consummated a deal for cheaper telephone rates for South Dakota upon which he has been working for the past two years. As soon as new lines now nearing completion can be connected, a rate of $1 for two minutes' conversation between Aberdeen and other South Dakota points, in proportion, on the Dakota Central with St. Paul and Minneapolis will be put into operation. The old rate has been $1.50 for three-minute conversations, this being the minimum rate, while the business interests of the country have contended for a cheaper two-minute rate. In response to public demand Mr. Zeitlow took up the proposition a couple of years ago and has been urging it ever since.

IOWA FALLS, Ia.—Prominent business men and farmers in a half dozen counties in this part of the state are interested in an inter-county telephone company that will operate a commercial telephone line. The company is to be known as the Hardin-Hamilton-Story-Marshall-Grundy-Franklin Mutual Commercial Telephone System, and will have through lines radiating to all the principal cities and towns in these six counties. The officers of the company are as follows: President, Roy Guy Fitzgerald of Union; vice president, Thomas Larson of Eldora; secretary, E. Stringer of Buckeye; directors, J. H. Wintermute of Hubbard, H. H. Brinton of Ellsworth, William Dunning of Iowa Falls, Etna Moore of Zearing, M. H. Green of Bangor, James Moore of Whitten.

LEVIS, Que.—The Bellechasse Telephone Company within the past year has built 900 miles of pole line and has added 600 subscribers. The company has lately secured a franchise in the city of Quebec and expects shortly to construct a modern telephone service for 6,000 subscribers. The company is capitalized at $1,000,000 and has some 3,000 miles of lines in operation. This extensive system had its origin in the erection of a private line in 1898 by Dr. J. F. Demers for the purpose of gaining communication with a fellow practitioner in an adjoining parish, and the same year a company was incorporated with a capital stock of $2,000 under the name of the Metis Telephone Company, which later purchased the charter of the Bellechasse Telephone Company in Bellechasse county.

DETROIT, Mich.—The plant of the Home Telephone Company of Detroit is being built by the Electric Construction Company of St. Louis, Mo. The same interests control both the telephone company and the construction company. The officers of the Electric Construction Company are: President, Max Koehler of St. Louis; treasurer, Sam B. Jeffries of St. Louis; general manager, W. B. Woodbury of Detroit; chief engineer, W. C. Polk of Birmingham, Ala. Chas. R. Ledlie of St. Louis is consulting engineer for the telephone company, and his representative on the ground is Joseph Lillich of St. Louis. The Commonwealth Trust Company is financing the proposition, and the company is represented on the ground by W. W. Grayson, formerly of the Kinloch Telephone Company The company has purchased a site for its central exchange building and it is expected to have this building ready for occupancy by May 15, 1907. Detailed plans and specifications contemplate a building to cover the entire lot, three stories, and devoted entirely to local and long-distance telephony. Telephone experts who have gone over the plans pronounce them the most complete and best adapted to telephone purposes of any plans ever drawn and calling for the most modern telephone building yet constructed. The company has also purchased property for its east exchange building. The type of switchboards and telephones has not yet been decided, but will be in the near future. The plant is being built underground for 30,000 telephones and is expected to be ready for operation some time during the summer of 1907. Some of the strongest men in the country are back of the enterprise.

ITEMS FROM THE RURAL LINE DISTRICTS

Illustrated by Charles Beaty

Frank Miller, of Moscow, is working on the new telephone to Blue Ridge.—*Shelbyville (Ind.) Republican.*

The New State Telephone Co. are taking out their line through Lakeport.—*Lakeport Correspondence in Sloan (Ia.) Star.*

The telephone business is booming. Several 'phones are in good working order.—*Henrietta Notes in Elyria (Ohio) Republican.*

The Glidden Telephone Company is improving the appearance of their lines by having the poles painted.—*Glidden (Ga.) Graphic.*

Telephoneman Harris is putting up new 'phones and looking for a central office location.—*Aviston Items in Carlyle (Ill.) Constitution.*

The Manitowoc and Western Telephone Co. are now stringing wires all over the country east of Greenleaf.—*De Pere (Wis.) Democrat.*

The people of Adams are rejoicing over the establishment of a night service at the telephone exchange.—*Adams Jottings in Fargo (N. D.) Forum.*

The farmers' telephone lines at this place are being pushed at a rapid rate. Wire stretching is the latest.—*South Everett Notes in Newaygo (Mich.) Republic.*

The new telephone line has come to a standstill. The farmers are too busy to complete the work just now.—*East Porter Correspondence in Janesville (Wis.) Gazette.*

George H. Clark is building his telephone line over from Lawrence Corner to Farmer's store at West Windham.—*Hudson Center Correspondence in Nashua (N. H.) Telegraph.*

The telephone people are unloading two car loads of poles of the greatest length ever erected in this vicinity.—*Phillips Correspondence in Grand Island (Neb.) Independent.*

The Planters' Telephone Company are building three lines into our place, with central office at the home of Miss Eureka Beasly.—*Gilbertsville Correspondence in Paducah (Ky.) Sun.*

The Clover Leaf Telephone Co. held a meeting here last Saturday for the purpose of running this line to Cuba City or to Fairplay.—*Louisburg Correspondence in East Dubuque (Ill.) Register.*

Our telephone line is still building up. Martin Lyons has put in a box and Mr. Thetford is going to put one in this week if they can get to him.—*Oakdale Correspondence in Jacksboro (Tex.) News.*

Goodheart has telephone connections with the neighborhood most of the time and with Harbor Springs and the rest of the world a little of the time and pays for it all of the time.—*Petoskey (Mich.) Independent.*

Mrs. Lizzie Booth has finished her duties as chief operator in the office of the Randolph telephone exchange. She left yesterday for Montreal, where she has a position as head dining room girl in the McGill Union Club.—*Randolph Correspondence in Burlington (Vt.) Free Press.*

At Eagle after October 1 central will answer no telephone calls earlier than 7 a. m. If father is sick previous to that hour Willie will have to run for the doctor or take chances of being an orphan.—*Eagle Briefs in Lincoln (Neb.) State Journal.*

The Highland telephone line has rearranged its wires in order to give its patrons better service and new patrons are taking advantage of their use.—*Shutesbury Correspondence in Springfield (Mass.) Union.*

The local telephone office installed a private telephoning booth the first of the week, an added convenience which will be much appreciated by patrons who use the lines from that office.—*Mt. Vernon (Ia.) Eye.*

The Groton-Ferney Telephone Company extended its line lately from Putney to Columbia, and the line has been kept hot ever since. It is like having a new toy to some people.—*Putney Notes in Aberdeen (S. D.) News.*

The telephone office has been moved to the new Frank Bell building on the southeast corner of the square, and the Misses Ida and Hazel Moon will have charge of the central office at night.—*Salem Notes in Burlington (Ia.) Hawkeye.*

The Jefferson County Telephone Company has had a sound proof booth placed in its central office in Charles Town. Patrons who want to send long distance messages will find it a decided convenience.—*Palm Beach Item in Charleston (W. Va.) Advocate.*

Local Manager Nels Willarson of the Wisconsin Telephone Company reports that applications for twenty-four telephones have been received so far this month. Guess that is going some and hats off to the plucky and enterprising manager.—*Menasha (Wis. News.*

Mart Driftmier went up to Hepburn Wednesday morning to look after that troublesome telephone switchboard that needed some attention. Mart is kept very busy by his duties as manager of the Mutual Telephone Co. of this city and the affairs of the company show the result of his hustling.—*Eldora (Ia.) Herald.*

W. B. Flack came to Waynesboro Monday to make arrangements for installing the new telephone system in one of our factories. The installation of the system will be a work of large magnitude. There will be twelve 'phones in the office and a large number in the different shops. As has been told, a Geiser telephone exchange wil' be established in the new office building.—*Waynesboro (Pa.) Record.*

Applications for membership in the Grand Order of Anti-Telephone Monopoly have been coming in so fast that it has been impossible to acknowledge all, but we will in time. The order has decided to confer special degree on all members who have ever dropped two nickels to get one call or have a kick coming against a telephone monopoly. There are only 42,000 of these degrees for Denver, so you better send in your name to-day. The sign of recognition of the order is to make a noise like a nickel.—*Golden Items in Denver (Colo.) News.*

WASHINGTON FIR I·E·C CROSS ARM

WE selected the Washington Fir Cross Arms because we found them superior for telephone and telegraph purposes. They are doubly inspected and are employed exclusively by the Western Union and Postal Telegraph Companies. Nearly all of the other large cross arm consumers of the U. S. use them. Get the Diamond Brand.

We are specialists in other good things for the telephone trade. If you haven't already done so, get our catalogue, try our house and see if specializing doesn't pay. A trial order will convince you. Quotations promptly furnished on anything you need.

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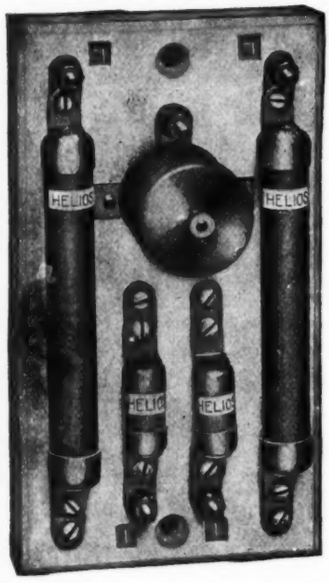

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Intercommunicating Telephone
Systems manufactured and installed complete. Dealers in Switchboards, Annunciators and all kinds of Telephone Apparatus. Cut shows plug type, metallic circuit. 3 to 25 stations.
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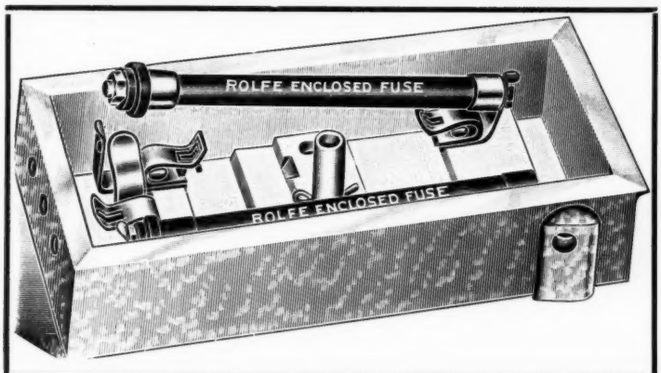

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QUALITY HIGH PRICES LOW
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The LEICH FOUR-PARTY

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We Inaugurated Selective Service and WE STILL LEAD

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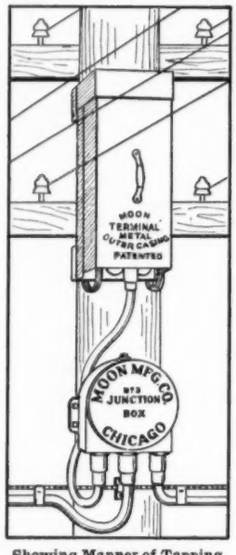

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DID YOU EVER

Study the Revolution in Cable Splicing - Distribution and Installation caused by Moon Combination Terminals and Junction Boxes.

Have you personally tested the merits of this apparatus?

If you are responsible for the dividends of your exchange you certainly should investigate, for we know we can save you money.

Why don't you try for yourself and be convinced of the superiority of our apparatus.

We are always pleased to furnish estimates upon request.

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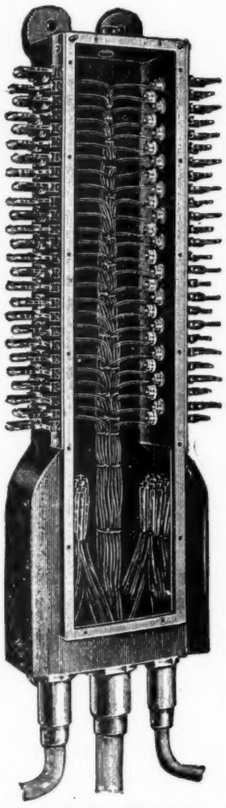
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MANUFACTURERS OF
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SEAMLESS **SEAMLESS**

Quality Unrivaled — Superior Finish

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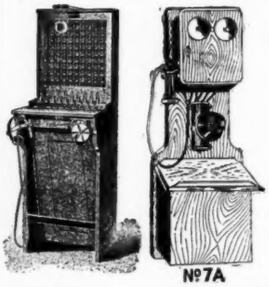
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FARR Write for Prices. Our Goods Guaranteed.
TELEPHONES AND SWITCHBOARDS TAKE THE LEAD.

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We have on hand all kinds of Telephone Apparatus but among our Special Bargains are:

1 Kellogg Switchboard, 100 drops installed
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250 Stromberg-Carlson Receivers
100 Kellogg Transmitters
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We must move this apparatus at once. We will name ridiculously low prices and guarantee all apparatus. We have on hand every make of telephone, switchboard and parts for same, as good as new, at one-quarter the market price. Let us quote you.

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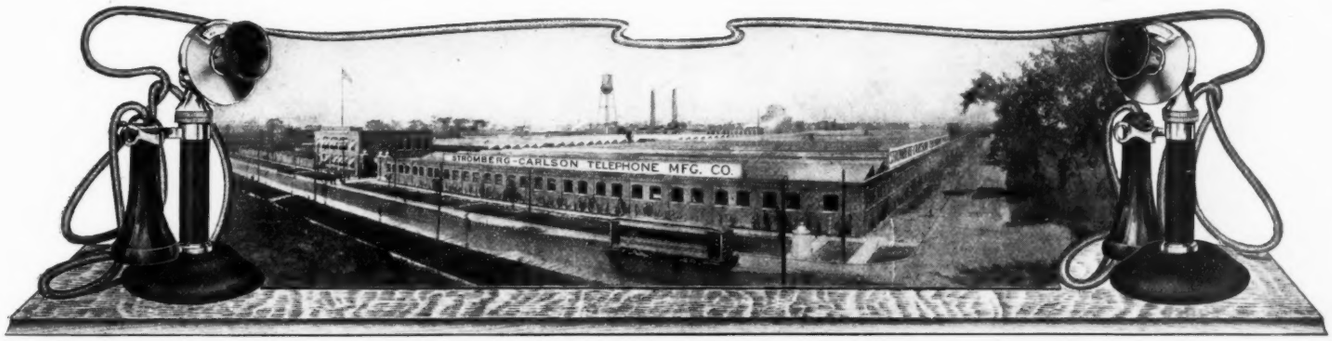

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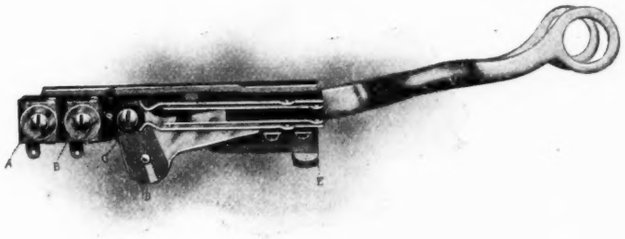
The accompanying illustrations show two styles of Hook-Switches, which, for efficiency, simplicity and mechanical construction are unapproached. The operation of these hook-switches is extremely simple and positive. The movement of the hook downward causes the hard rubber pin (*c*) to be drawn in between the springs, thus breaking contact; while the upward movement of the hook allows them to come together and close the circuit. The hook lever is made of heavy cast brass mounted on a strong frame and provided with German silver springs, which are insulated from each other and the frame by hard rubber strips. All contact points are of pure platinum. Thorough reliability and the highest efficiency are guaranteed.



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The Clay Product Company is a new corporation which has recently purchased the plant of the Continental Clay & Mining Company and now has an excellent equipment for the manufacture of

Vitrified Clay Conduit

A considerable quantity of the different sizes is now in stock, and prompt delivery is guaranteed.
The product of this plant is made to standard specifications and will satisfy the most particular telephone and electric light companies.
Contracts for next year's delivery are now being closed.

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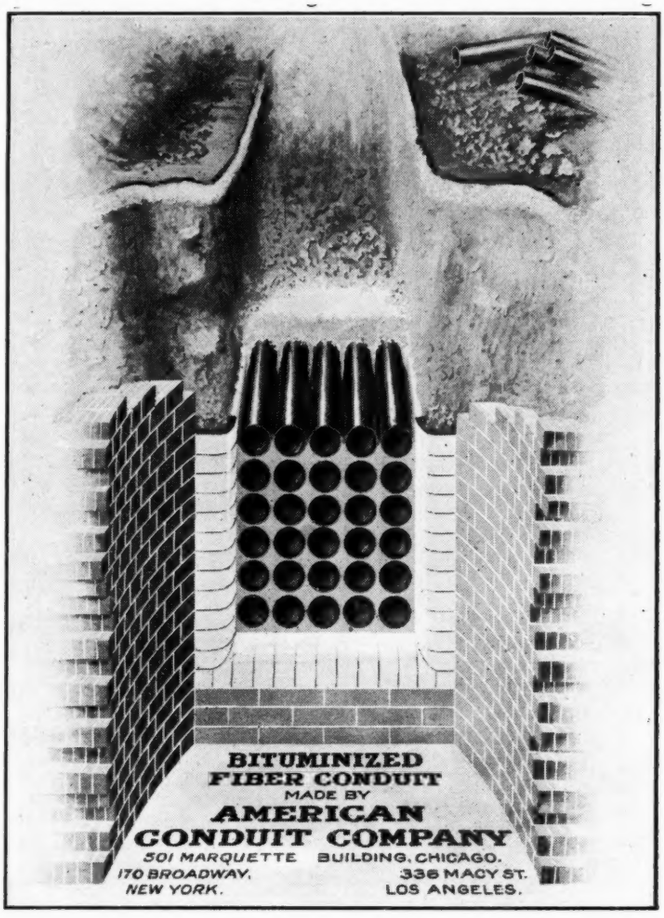

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Factories in Five States

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OKONITE RUBBER COVERED TELEPHONE WIRES have been installed by the largest telephone companies and invariably give satisfaction. Okonite insulation remains the same at all temperatures, is not effected by commercial acids or alkalies and will not deteriorate but improves with age. See that your next order reads OKONITE. Saves time, trouble and rewiring expense.

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FOR UNDERGROUND SYSTEMS

The Fibre Conduit Company
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MEASURED SERVICE

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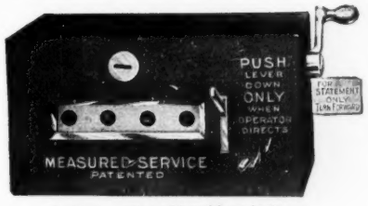

Style A. Size 4¼ x 2¾ x 2 inches.

INSTALLATION CHARGE IS LIGHT
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Voltmeters, Millivoltmeters, Voltammeters; Ammeters, Milammeters, Ground Detectors and Circuit Testers, Ohmmeters, Portable Galvanometers.

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Semi-Portable Laboratory Standard Voltmeters and Ammeters

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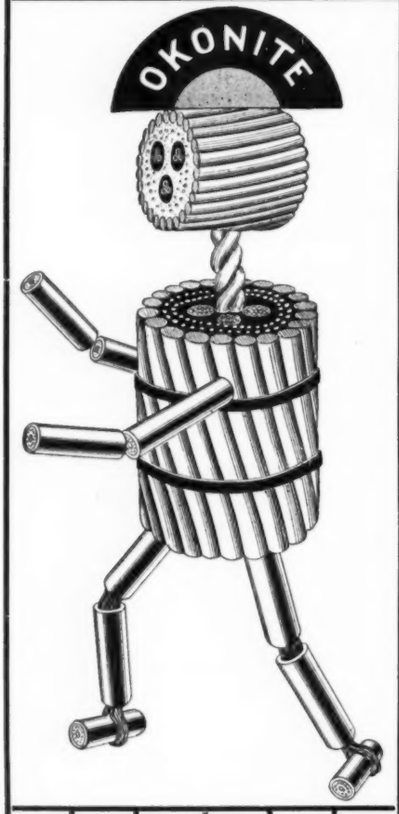

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Cash Register and Pay Station

(The PIONEER in this line)

THE BEST TELEPHONE SERVICE

MEASURED SERVICE

A cash ticket with every collection.

One gong only.

One ring for 5 cents.

Two rings for 10 cents.

Five rings for 25 cents.

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It keeps collections right

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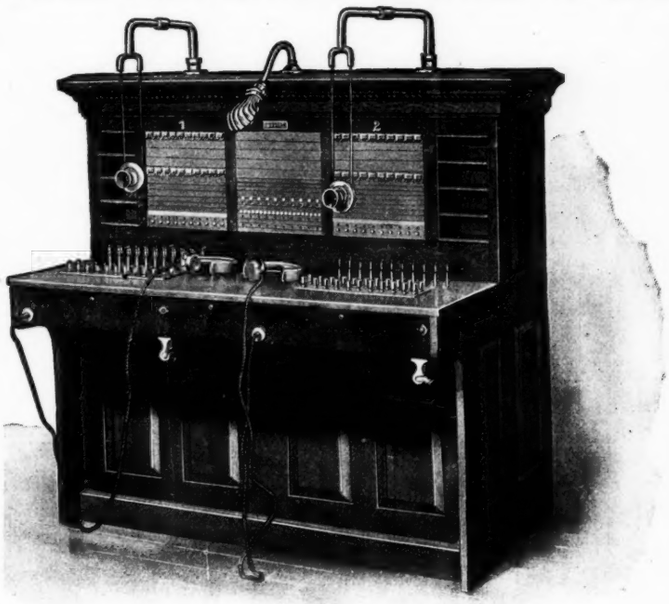

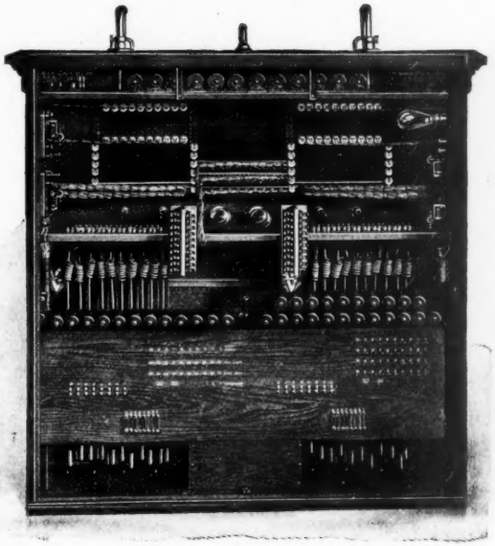

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It has not been so very long ago that it was the usual thing to connect the toll lines to drops on the local switchboard and to have the subscriber's operator look after them between calls. In those days a special toll board was a novelty, generally a very crude affair, consisting often of a "wart" or bracket cabinet on the end of the local switchboard.

The almost phenominal extension of long distance lines, the ever increasing popularity of this means of communication, and the strong competition between the old company and the independents, has brought about a demand for a more adequate and efficient class of equipment, designed especially to handle such service.

These illustrations show a type of toll board built by us for one of the largest Long Distance companies in the independent field, for a busy exchange and switching point. It embodies all that is best and up-to-date in toll boards. Built under specifications, subjected to rigid inspection, and guaranteed as to quality and efficiency.

If you are in need of a modern toll board, let us have your specifications or tell us your requirements and we will draw specifications for you, subject to your approval. No charge for making specifications and estimates.

If undecided as to what you want or need, write us and we will send an engineer to talk it over.

The NORTH ELECTRIC CO.

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TELEPHONE CABLE

If you want Telephone Cable and can't wait till snow flies to get it, send us your specifications and get our PROMPT DELIVERY PRICES.

We are RIGHT on CABLE.

THE WESCO SUPPLY COMPANY

"Everything Electrical"

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IF YOU ARE READY

FOR A NEW

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WE WOULD LIKE TO SEND SAMPLES OF THE WORKING PARTS OF OUR

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An Absolutely Reliable Self-Restoring Drop Apparatus, with all like parts interchangeable

MADE IN ANY CAPACITY
A PERFECT APPARATUS

NOTE—The largest Magneto Multiple Self-Restoring Drop Board in the world is of this type and was manufactured by the

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SOLD TELEPHONES 13 YEARS AGO

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The Pioneer Factory **Established 1893**

WESTERN TELEPHONE MFG. CO.

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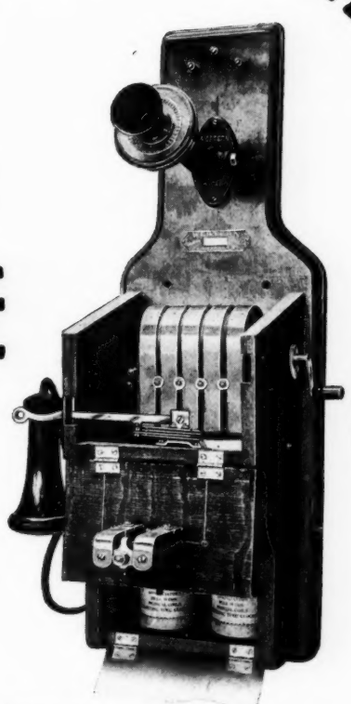

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We Make Switchboards Too

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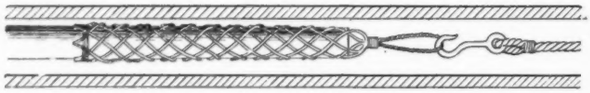

We have made and sold

The Gem Wire Grip

for pulling in Telephone and Electric Light Cable for the past three years. By experience we know how to make this device so that it will stand the severe strain of Cable Pulling. It is guaranteed superior to any other come-along ever made. All other types of this class are infringements, and purchasers are warned.

The Gem Wire Grip

is made in various styles adapted to different purposes. The Double Eye Grip being for aerial cable and other uses, and the Single Eye for either aerial or underground cable, while the Split Grip is designed to displace the half hitch of marline, heretofore used for taking in slacks.

All of these devices have more than "made good" and will prove genuine economies to all telephone companies having work of this character to do.

We make other Telephone Construction Specialties. Write for circulars and prices.

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—Not that Nungesser Batteries have brains, but that it takes brains to make them.

Brains, trained through nineteen years' experience, studying the many problems of battery manufacture, give to the "1900" Dry Battery a superiority that is best attested by its extensive and ever-increasing sale in all parts of the world where dry batteries are used.

If the name **NUNGESSER** is on your dry batteries you may be sure they are right, and yet it costs you no more to get this stamp of excellence and the good service that always goes with it.

Nungesser Batteries are sold by most good electrical dealers the world over.

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CLEVELAND

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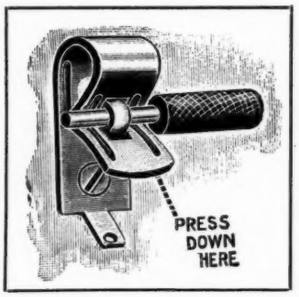
To Get Something For Nothing

is usually impossible. There is one instance, however, when it really does happen; that is when you get your dry cells equipped with

FAHNESTOCK SPRING BINDING POSTS



From the very day you install a battery equipped with this Post, the maintenance costs due to poor, broken or corroded contacts are entirely eliminated. This post is not an experiment but an assured success. During the time it has been on the market, millions have been sold and every person who has once tried it will use no other. The reason for this is its absolute merit. It does save money, it does away with battery terminal troubles and is an important factor in giving good service.

We will mail you a sample without charge, and you can get your batteries equipped with it free of cost by specifying Fahnestock Post in your order.

Fahnestock Electric Co.

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2 SUCCESSFUL "STANDARD" SPECIALTIES 2

For the benefit of numerous inquirers, we desire to state that these devices have been proven wholly satisfactory in every respect and that the validity of their patents has never been in question.

We not only guarantee you satisfactory service but insure freedom from any patent litigation.

The Standard Pole Changer and The Standard Duplex Set are both of the very highest standard.

Order either or both; sent on 30 days' trial, without obligation.

The Standard Pole Changer

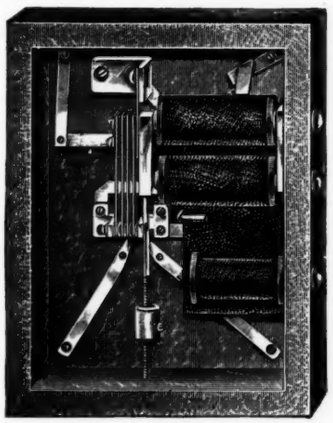
Absolutely Guaranteed

Simple, efficient, economical. Only one battery of forty to fifty ordinary dry cells required. Works perfectly on all alternating and direct pulsating current ringing.

Sent on 30 days' trial.

Present price, only $15.00

SEND US YOUR ORDER.



The Standard Duplex Set

Another Money Maker

By using this instrument you can carry on two conversations over any single metallic bridging line without either conversation interfering with the other.

Sent on 30 days' trial.
Let us explain it to you.

Price complete, per set, $15

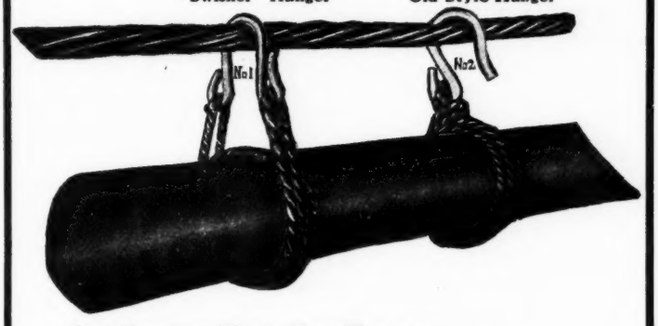
WE TAKE ALL CHANCES.

CURRENT ELECTRIC COMPANY, 52 State St., CHICAGO

Swisher Cable Hanger

(PATENTS PENDING)

"Swisher" Hanger Old Style Hanger



Just Compare These Two Hangers.

Notice formation of hook and method of attaching marline in Swisher Hanger.

The heavier the weight the better it holds.

Old Style straightens under 330 lbs. strain.

Take another look at them, then send for our new descriptive circular quoting prices.

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THE W. G. NAGEL ELECTRIC CO.

27-31 St. Clair St., Toledo, Ohio

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Telephone Apparatus of our own Manufacture at Attractive Prices

A COMPLETE LINE OF CONSTRUCTION MATERIAL

Our Guarantee Covers Both Quality and Price

The B-R Electric & Telephone Manufacturing Company

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Please tell the Advertiser you saw his Announcement in TELEPHONY.

DON'T TRY

to save money by using thinly galvanized wire, made from common grades of steel, for Telephone Wire. *It pays to use the best.* ROEBLING DOUBLE GALVANIZED Telephone Wire is made from carefully selected materials and galvanized by methods which are the best results of an experience of more than 50 years. It is the cheapest wire on the market, not because it is the lowest in price, but because it gives good service years after inferior grades have been discarded. -:- -:-

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MANUFACTURERS OF

"MONARCH" BRAND HIGH GRADE

Telephone and Telegraph WIRE

E. B. B.-B. B.-STEEL

Single and Double Galvanized Signal Strand

OUR WIRE STANDS THE MOST EXACTING TESTS.
IF YOUR SUPPLY HOUSE CANNOT FURNISH IT, WRITE US. WE CAN.
PROMPT SHIPMENTS ALWAYS.

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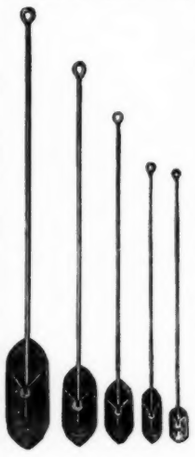
HERCULES
Malleable Iron Anchors

(PATENTED)

Webster defines an anchor as "a contrivance or instrument designed to hold fast."

That's the "HERCULES" IT HOLDS FAST



Totten says: "Anchors are of different sizes. The largest and strongest, and that on which most dependence is placed, is the sheet anchor."

That applies to our guy anchors as well as it does to ship anchors. The "HERCULES" comes in five sizes and every one of them is a "sheet anchor." Absolute dependence can be placed on them because they are made of the best material and pull against solid earth.

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